

Poster Session P01/Orthodontics

P01-1

The use of oral screen as the treatment to minimize the malocclusion due to thumb sucking

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Introduction: Thumb sucking is hereby interpreted as all habitual sucking on thumb, other fingers, a lock of hair, a sleeve, pillow, sheet, blanket or toys. This sucking taking place while dozing off, or during sleep or at any time of the day when there arises need for solace. Prolonged thumb sucking may result as malocclusion in later year of life. Oral screen is an effective appliance which is easy to use to minimize the malocclusion due to thumb sucking.

Aim: This paper will discuss a case of a 6-year-old girl with upper incisors protrusion and experience oral habit which is thumb sucking.

Case report: This is a case of 6 year-old girl with chief complaints are the upper anterior teeth protruding, so the lips can not be closed properly. The child experience thumb sucking since the age of 2 year. The initial measurement of overjet is 13 mm and overbite 8 mm. After using oral screen for 4 months, the overjet become 9 mm and overbite 5 mm.

Conclusion: The use of oral screen for 4 months with the period of time 12–16 h per day can change both the overjet and overbite of the patient. Nevertheless, patient's oral bad habit also can be reduce by this appliance.

P01-2

Analysis of stress and distortion distribution using the finite element method – effects of the chin cap on the mandible

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Introduction: One of the mostly used appliance for the crossbite in primary and mixed dentition is chin-cap. Chin-cap appliance has some advantages, but several disadvantages too. So, various effects of chin-cap should be evaluated. The purposes of this case report was to analyze the amount of stress and the distribution of distortion condition when the traction force of 500 g was applied to the condyle head from the chin area. For this, 3-dimensional scanning, mandible modeling, and mesh formation were performed.

Case report: Traction force of 500 g was applied to the condyle head from the chin area. Moreover, we made a dissection at the midline of the mandible. From that one point and surface of dissected midline, intended 0.5 mm distraction distance was given and analyzed the amount of stress and distortion at the each position. Mandible was divided into 10 position by anatomical landmarks (Condyle, Notch, Ramus posterior, Coronoid process,

Ramus center, Gonion, Ramus anterior, Base anterior, Infradental, Menton).

Comments: When traction force of 500 g was applied to the condyle head from the chin area, condylar neck area showed the greatest amount of stress and coronoid process was the least. For the distortion condition, infradental area showed the greatest amount. When 0.5 mm of intended surface expansion was applied at the dissected surface of mid-mandible area, base anterior area showed the greatest amount of stress and coronoid process was the least. For the amount of distortion, infradental and menton area showed the greatest amount. At 0.5 mm of intended one point expansion, ramus posterior area showed the greatest amount of stress and menton area was the least. For the amount distortion, menton area showed the greatest amount of distortion condition.

P01-3

Induced ankylosis of a primary molar for mesial protraction of permanent molar

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Introduction: Mesial protraction of mandibular posterior teeth requires increased anchorage in the anterior area of the dental arch. If the anchor units are only dental, this may inevitably lead to undesired tooth movements and loss of anchorage. Skeletal anchorage through the use of orthodontic mini-implants has been successfully used for such cases. Here, we discuss a technique alternative to mini-implant devices for maximum anchorage.

Case report: A 13 year-old Caucasian female with a free medical history was referred to the Department of Orthodontics, Dental School University of Athens for orthodontic treatment. The patient presented with a dental Class II (cusp to cusp) subdivision right malocclusion, deep bite and congenitally missing of the upper and lower right second premolars (15, 45). The deciduous second molars were in place. The treatment plan involved removal of the deciduous second molars and mesial protraction of posterior teeth in order to close the space. To establish maximum anchorage and avoid mesial tipping of the right lower first molar, induced ankylosis of the primary second molar (85) was performed. This would allow the ankylosed tooth to serve as skeletal anchorage. The technique involved extraction of the primary molar, bisectomy and removal of the distal half of the tooth and replantation of the mesial half after endodontic treatment and removal of the periodontal ligament. A rigid splint was used for stabilization. Ankylosis was verified after 10 weeks through clinical and radiographic examination and the splint was removed, followed by full orthodontic treatment.

Comments: Induced ankylosis of primary teeth can be used successfully as an alternative to orthodontic implants, showing excellent biocompatibility and requiring minimal cost.

P01-4

Influence of maxillary expansion on pharyngeal airway morphology

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Background: Obstructive sleep apnea syndrome is one of the high-risk diseases, which may cause growth inhibition, pulmonary heart, mental retardation and even sudden death. As most of these symptoms are caused by the upper airway obstruction by the adenotonsillar hypertrophy, adenotonsillectomy by otolaryngologists is the main and common treatment for the syndrome. On the other hand, maxillary rapid expansion by orthodontists is reported to be effective as a non-surgical treatment in reducing nasal airway resistance and improving sleep apnea.

Aim: The purpose of this study was to evaluate the morphologic changes in the pharyngeal airway by maxillary expansion and discuss the possibility that the maxillary expansion can be an option in the treatment of childhood obstructive sleep apnea.

Design: Nine Japanese healthy children with malocclusion and without complaint of sleeping disorders participated in this study. Rapid or slow type maxillary expansion appliance was used for the treatment. Several lateral cephalograms were taken during the treatment at before the treatment (T1), at the end of the expansion (T2), at the suitable time of observation (T3~T6). The measurements of the airway using the cephalograms were conducted according to the method by Martin et al (2006) and McNamara (1984).

Results: Several airway dimensions were affected by the maxillary expansion. Especially the Nasopharyngeal area of each case increased after the expansion.

Conclusions: Maxillary expansion appliance has some influence on pharyngeal airway morphology. However, more accumulations of data were required in order to know the precise effect of the expansion in the airway of children.

P01-5

Case report of treating class II malocclusion patient using T4K™

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Introduction: T4K trainer™ is a myofunctional regulator developed to be used in children of mixed dentition. Labial bow included in the device exerts strength in excessively labial slanted upper jaw. Lip bumper blocks strength of lower mouth to prevent abnormal strength exerted in lower jaw. Tongue tag secures proper position of tongue, and additional exercise is not required for child patients. Furthermore, simpler design and softer texture of device promoted cooperation of patients during use. This case report is to report the satisfactory results gained by using T4K on Class II patients.

Case report: Two patient (9 Year/Male, 8 Year/Female) who had visited our clinic. They were treated by T4K for 8 month.

Comments: T4K was applied in Class II malocclusion patients of mixed dentition with expected space insufficient to gain facial improvement. Excessive overjet and overbite were improved. Main effects are regarded to have been achieved by development of lingual slant of upper jaw, labial slant of lower jaw, and lower part of jawbone. Bad habits, such as mouth breathing, can also be adjusted. It is more easy to gain cooperation from patients when compared to other devices.

P01-6

Maxillary canine impaction at orthodontic patients with and without agenesis. A demographic study

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Background: It has been reported that maxillary canine impaction is seen often concomitant to tooth agenesis.

Aim: To investigate the prevalence of maxillary canine's impaction in orthodontic population with agenesis and to compare it with group of orthodontic patients without agenesis.

Design: Without third molars considered, agenesis group comprised 295 orthodontic patients. A control sample of 909 orthodontic patients without agenesis was also used. Diagnosis of canine impaction was based on initial panoramic radiographs and estimation of dental age, considering unerupted maxillary canines after the dental age of 11 as impacted. Patients' gender was also recorded. ANOVA test was used to investigate whether maxillary canine impaction was influenced by the presence of tooth agenesis.

Results: Maxillary canine impaction was detected in 3.85% ($n = 35$) of the non-agenesis orthodontic patients. Twenty-eight of them were female and seven male (ratio 4:1). In the agenesis group impacted maxillary canine' prevalence was 4.75% ($n = 14$). Eight patients with agenesis and impaction were female and six male (ratio 1:1). Maxillary canine impaction was not seen more often with tooth agenesis ($P = 0.499$). Bilateral impaction was detected in 12 patients (34.3%) of the non-agenesis group and in three patients (21.4%) of the agenesis group. Sex distribution was even for patients with impaction at the agenesis group, but considerably more females were seen carrying impactions in the non-agenesis group.

Conclusions: Impacted maxillary canines were not seen more often at patients with agenesis. Impaction was seen more often in females in the non-agenesis group, but not in the agenesis group.

P01-7

Space maintainer: a case report

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Introduction: Primary teeth are important for the child's future dental health. Their presence enhances a normal development of the maxillary bones and soft tissues. Early loss of primary teeth is often due to a poor dental status requiring an early extraction of deciduous elements while the permanent elements are immature. A loss of space could also interfere with the eruption sequence. The use of space maintainers is recommended to avoid loss of space. In this case report, the use of a unilateral space maintainer is discussed as one of the available solutions in paediatric dentistry.

Case report: A 7 year-old boy was referred to our paediatric department with a recurrent abscess of the right primary first molar. The x-ray examination confirmed an external root resorption. The extraction was decided and a band and loop appliance was fixed in order to fill the gap.

Comments: Space maintainers are important devices to keep the open space for the permanent teeth and to help guide them into correct position. If left untreated, the loss of space could result in extensive orthodontic treatments.

P01-8

Management of unerupted maxillary incisor or canine with fixed appliance: case report

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Introduction: Dilaceration is a dental deformity characterized by an angulation between crown and root causing non-eruption of the tooth. It generally occurs following trauma to the maxillary deciduous incisors the apices of which lie close to the permanent tooth buds. The maxillary canine is the second most commonly impacted tooth after the mandibular third molars. The maxillary permanent incisors and canines are the foundation of an esthetic smile and functional occlusion. Any factor that interferes with their normal development and eruption can lead to serious consequences. The pediatric dentists must be able and prudent enough to localize the teeth accurately and use an effective traction system that brings the teeth into occlusion without damaging the soft and hard tissue structures in the vicinity.

Case report: In this case report, three cases of impacted tooth (one dilacerated maxillary central incisor and two maxillary canines) at mixed dentition or early permanent dentition are presented. A fixed appliance was used to bring the impacted teeth into place. It is described how the teeth were successfully moved into alignment in a young patient with proper surgical and orthodontic management. The panoramic and cephalometric radiographs before the treatment were compared with the one at the end of the treatment. The post-treatment records demonstrated good alignment of the impacted teeth and the adjacent teeth.

P01-9

A dilacerated central incisor: a case reportM. KULAN¹, B. ÇANKAYA², L. USLUCAN² & I. ULUKAPI¹*¹Faculty of Dentistry, Department of Paediatric Dentistry, Istanbul University, Turkey ²Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Istanbul University, Turkey*

Introduction: One of the reasons known for the non eruption of teeth is dilaceration. The term 'dilaceration' refers to an angulation or a sharp bend or curve, in the root or crown of a formed tooth. The condition is thought to be due to trauma during the period in which the tooth is forming, with the result that the position of the calcified portion of the tooth is changed and the remainder of the tooth is formed at an angulation. The curve or bend can be anywhere along the length of the tooth.

Case report: A 9 years-old girl referred to Paedodontics Clinics of Istanbul University Faculty of Dentistry with the complaint of a

non-erupted maxillary left central incisor. She had a history of trauma at age of 3, which resulted in intrusion of her deciduous maxillary left central incisor. Panoramic examination revealed the presence of a non-erupted central incisor. Our treatment plan was the orthodontic forced eruption of the tooth, but the elevation of the full-thickness flap discovered the severe dilaceration; so we decided to extract the tooth. The flap was then repositioned. After healing a removable partial prosthesis was applied.

Comments: For this case removable partial prosthesis is a short-term treatment plan for space management and to rehabilitate esthetics. With the completion of dental and skeletal growth other treatment alternatives (like implant) can be chosen.

P01-10

The interrelationship between the position of impacted maxillary canines and the morphology of maxilla

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Background: It is generally known that impacted canine is more common in males than females and that palatal impaction is more common than buccal impaction. However, according to the study by Kim et al. (2011) and Zhong et al. (2006), buccally impacted canines were more frequently seen in Koreans and Chinese. This shows that there is a different tendency of canine impaction between Caucasians and Far East Asians. This study was carried out because we considered that the difference in the morphology of maxilla between two ethnic groups might have an effect on the position of impacted maxillary canines.

Aim: The objective of this study was to find out if there is a difference in the morphology of maxilla between the buccal and palatal impacted group.

Design: This study focused on patients who had visited the Seoul National University between year 2005 and 2010 for treatment of impacted maxillary canines. Buccal and palatal impaction cases, consisting of 50 people in each group, were randomly selected from these patients.

Results: As a result of comparing multiple measurements between two groups using independent *t*-test, 'Arch length/Intermolar width' ($P < 0.0001$), which represents the arch morphology, and palatal vault depth ($P < 0.0001$) showed significant difference.

Conclusion: (i) Morphology of the maxillary arch was more narrow and long with a high palatal vault in the palatal impaction group compared to the buccal impaction group. (ii) There was no difference in space deficiency for proper teeth alignment between two groups.

P01-11

Approaches to managing mandibular premolar impaction – two case reports

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Introduction: Impaction of mandibular premolars is observed in some clinical cases. Herein, we report two cases we experienced.

Case report: Case 1 involved a female patient at 11 years and 2 months. Case 2 was a female patient at 11 years and 7 months. Both patients were referred to our department by local dentists because of the patients' principal complaint of delayed eruption of the right mandibular second premolars. In Case 1, the patient was treated by extraction of the second deciduous molar, with subsequent fenestration. Then a lingual arch was applied to the tract of the second premolar. Traction treatment was continued for 10 months. In Case 2, a local dentist extracted the second deciduous molar. Thereafter, the patient visited us regularly for follow-up. The second premolar eruption was confirmed in a regular checkup 10 months later.

Comments: According to the method described by Kobayashi et al., the tooth germ obliquity was 64° in Case 1 and 72° in Case 2. Takagi et al. reported distal obliquity of not < 65° as the criterion of performing fenestration after extraction of a preceding deciduous tooth. However, neither of our cases met the criterion: fenestration and traction were performed in Case 1, where the obliquity was 64°. Case 2, with obliquity of 72°, was merely followed without treatment. Based on the results reported here, we suggest that impacted premolar treatment should be discussed based on CT and other three-dimensional data in addition to two-dimensional images.

P01-12

Growth enabling modified fixed palatal retainer

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Introduction: Osseo-integrated implants and fixed prosthetic appliances cannot be used for the patients with ongoing skeletal growth. Therefore, removable appliances are preferred in cases with missing maxillary anterior teeth.

Case report: This case report describes the treatment of two growing patients with missing maxillary incisors using a novel

appliance that can be used as a temporary treatment approach. In both cases, two orthodontic wires adjacent to the palatal aspects of all maxillary teeth were soldered to stainless-steel molar bands were used. A tube with wide lumen was soldered on one of the arch wires. The arch wire on the opposite side was adjusted to locate in the lumen allowing it easily slide in the tube. Acrylic teeth with appropriate color and shape for the edentulous space were chosen and were bonded on the appliances using auto polymerizing resin. Also the wire that entered the tube was marked with a diamond disk at the entrance of the tube to determine any possible growth on the control appointments.

Comments: No pathological signs or symptoms were observed at the 12th month follow-up. Expansions of the appliances as a result of maxillary growth were observed for both of the cases. In these case reports, a novel appliance is introduced which can be a solution for lack of permanent anterior teeth by passively enabling transversal maxillary growth for a long time. Therefore, the need for renewal of the appliance is expected to be eliminated.

P01-13

Two effective methods for correcting severe rotation of anterior teeth

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Introduction: Severe rotation of tooth is one of the most common problem in orthodontics and considered as a developmental phenomenon. These rotations can cause cosmetic problems, gingival recession and traumatic occlusion.

Case report: This case report presents two treated cases by using removable appliance in severe tooth rotations. Case 1) severe rotation of right upper central incisor in a 9-year-old girl is corrected with removable orthodontic appliance and whip spring. Case 2) severe rotation of left lower lateral incisor in a 8-year-old girl is corrected with couple force of elastic anchored on removable orthodontic appliance. In this report, it was revealed that, in order to correct the problem, in the first case a removable appliance with a whip spring was used and in the second case, a removable appliance in combination with bracket and elastic was efficient in order to prevent from a complicated orthodontic treatment in the future.

Comments: By using removable appliances, severe rotations can be treated. Also, gingival damage, tooth attrition and transposition of other teeth could be prevented. Early treatment of these rotated teeth could improve dental aesthetic affecting on child's behavior and enhanced self confidence.

P01-14

Evaluation of relationship between orthodontic treatment need according to dental aesthetic index (DAI) and student's perception, in 11–14 year-old students

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Introduction: In contemporary dental treatment, the number of people who demand orthodontics for improving their psychosocial problems related to facial esthetics, has been increased.

Aim: The purpose of this study is the determination of relationship between orthodontic treatment need according to dental aesthetic index (DAI) and student's perception, in 11–14 year-old students, in Ahwaz.

Design: This descriptive cross sectional study was performed on 900 students (450 girls, 450 boys). The students participated in the study only if they had not received any orthodontic treatment before or at the time of the study. Two questionnaires were used, the first one included different DAI criteria and the second one included questions on student's perception of the appearance of their teeth. The results were analyzed by Chi-square test and *T*-test.

Results: In 70.9% of the students, the DAI score ranged from 13 to 25, in 19.2% DAI from 26 to 30, in 7.8% from 31 to 35, while in 2.1% the score was > 35. The relationships between DAI Score and sex, chewing and talking were not statistically significant ($P > 0.05$), but the relationship between DAI score and need to orthodontic treatment and satisfaction of dental appearance were significant ($P < 0.05$). Between sexes, boys had higher need for orthodontic treatment compared to girls, but not statistically significant. ($P > 0.05$).

Conclusion: Results of this study, show a significant relationship between the need for orthodontic treatment and student's perception.

P01-15

Cost effectiveness of three methods of replacement of congenitally missing teeth

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Introduction: In surveys done in the United States, dental health disturbance cost approximately 1, 7 workhours lost per year. However, increased patient demands for ideal occlusion that dentists can encounter involve replacement of congenitally missing teeth. Such replacement means greater patient and practitioner involvement with increased cost.

Aim: The purpose of this study is to compare the total cost of replacing a missing tooth with three replacement options: autotransplantation, implants and fixed prosthodontics.

Method: Cost analysis for each of the stages involved for each of the approaches of replacement of a missing tooth were considered. The dental cost of each intervention was calculated according to the pricelist proposed by the Swiss dental federation. Additional cost (patient workhours lost etc) was calculated based on the existing bibliography.

Results: The total cost of autotransplantation was found to be two times less than fixed prosthodontics. Implant placement as a process is more invasive than autotransplantation therefore involves higher cost – and in the long term they cost less than fixed prosthodontic rehabilitations.

Conclusions: Although all methods present advantages and disadvantages our results suggest that autotransplantation is a cost effective method that should be considered for replacing congenitally missing teeth.

P01-16

Ectopic eruption of maxillary permanent first molars. Treatment timing and biomechanical considerations

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Introduction: Ectopic eruption of the permanent first molars occurs in 3–4% of children in mixed dentition and involves mainly the maxillary arch. Adverse effects include the mesial inclination of the maxillary molar and the premature resorption and exfoliation of the primary second molar. In more severe cases, a class II molar relationship and a crossbite of the permanent molar are induced, whereas the second deciduous molar is either prematurely lost or impacted.

Case report: Cases in mixed dentition presenting unilateral or bilateral ectopic eruption with different degree of severity will be presented. The treatment plans vary from simple observation of the patient on a 6 month recall base to full orthodontic treatment. When dealing with a slight mesial inclination of the permanent molar the placement of a separator or a deimpaction spring is usually enough. If treatment is decided to commence at a later stage and extractions of the deciduous second molars are necessary a space maintainer should be placed. If the permanent molars have moved forward and their repositioning to the ideal location is decided this can be accomplished with the use of either a removable or a fixed appliance in combination with headgear. The choice of the appropriate headgear type is made after thorough cephalometric analysis of the skeletal facial pattern. Generally, the mechanotherapy may include simple separators, deimpaction springs, space maintainers, headgear, removable and fixed orthodontic appliances.

Comments: The treatment timing and the choice of appropriate mechanotherapy should be carefully considered depending on the severity of the case, the age of the patient and the malocclusion. Two phase orthodontic treatment approach is usually indicated.

P01-17

Epidemiology of dental malocclusions in a Greek male population

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Aim: To define the prevalence of dental malocclusions and make an overview of the general dental health in the Greek adult male population. Further, we sought to evaluate the need of oral health prevention at younger ages from the paediatric dentist, orthodontist and the general dentists.

Design: Clinical evaluation of the prevalence of dental malocclusion (Angle classification system) in 3000 Hellenic army recruits, aged from 18 to 40, from 2010 and 2011. Supernumerary and congenitally missing teeth along with anterior and posterior crossbites were also taken into consideration. Patients with previous orthodontic treatment, extensive prosthetic rehabilitations, congenital syndromes and maxillofacial surgery were excluded.

Results: The statistical evaluation revealed that 64.2% of the sample had a class I molar occlusion, whereas 25.35% had a class II molar relationship and the 9.05% had a class III molar relationship. 0.5% of the total sample presented supernumerary teeth and 3.7% congenitally missing teeth. Signs of periodontal disease and caries were also recorded with a brief clinical examination.

Conclusion: There is a distinct predominance of the Class I type of malocclusion corresponding to the bibliographic findings; however, many young adults who participated in the study seemed to suffer from consequences of reduced oral health, adding to the assumption that an extensive prevention-oral health promotion program is necessary for the Greek population.

P01-18

Unilateral congenitally missing mandibular second bicuspid. Early clinical treatment following diagnosis

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Introduction: The purpose of this presentation is to exhibit, through photographs and x-rays, four cases associated with unilateral congenitally missing second mandibular bicuspid.

Case report: Pediatric dentists are usually the first to diagnose congenitally missing teeth and can undertake one of four options that might significantly reduce the duration of orthodontic treatment: (i) Immediate removal of the second deciduous molar to allow adjacent teeth to close the space. (ii) preservation of the

deciduous molar and reproximation of its mesio-distal part in order to limit their size to the dimension of the second bicuspid of the other side and maintenance of its presence until early adulthood to allow its replacement by an implant. (iii) Extraction and closure of the space by means which will not lead to deviation of the lower midline and lingualization of the lower anteriors. (iv) Pulpotomy of the second deciduous molar and then bisection and removal of the distal part in a way that the mesial root acts as anchorage for the first bicuspid while the first molar freely moves mesially. To permit the unimpeded movement of the molar, premature contacts of the upper second molar should be taken away.

Comments: In conclusion, the timely cooperation of pediatric dentists and orthodontists allows occlusion assessment and detection of other orthodontic problems like, absence of third molar and possibly pre-existing disparities in lower midline. Bearing in mind the final result with regards to the occlusion and profile the above should suggest the most appropriate solution for each case.

P01-19

Anterior cross bite treatment: two different approaches

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Introduction: Anterior crossbite term describes an abnormal labiolingual relationship between one or more maxillary and mandibular incisor. Different techniques have been used to treat anterior crossbite in children in early mixed dentition such as tongue blades, reversed stainless steel crowns, fixed acrylic planes, bonded resin-composite slopes and removable acrylic appliances with finger springs.

Case report: This case report describes the treatment of six patients in mixed dentition with anterior cross bite. In three cases, bonded resin-composite slopes were used; the other cases, removable acrylic appliances with finger springs were used to treat anterior cross bite. Bonded resin-composite technique, 3–4 mm resin composite applied to the incisal edge of the mandibular incisors with an angle 45° to the longitudinal axis of the tooth and correction was achieved within 1–2 weeks. With removable acrylic appliances, treatment has been finished in 6–7 weeks.

Comments: The aim of the treatment for anterior cross bite is to reposition the affected maxillary tooth/teeth and provide stable overbite and overjet relationship. In bonded resin-composite technique; treatment time is short, the procedure is easy and cost is low however teeth movements are rapid. Removable acrylic appliances with finger springs is a safe method but patient cooperation and laboratory phase is required and treatment period takes long time. As a result, both techniques are found effective for anterior cross bite correction in mixed dentition also no pathological signs observed involving the tooth or the marginal periodontal tissues.

P01-20

Space maintenance in premature loss of deciduous teeth

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Background: Deciduous teeth play an important role in oral growth and development, in esthetics, eating, speech and to encourage normal function and resultant expected growth. In case of early loss of deciduous teeth it is recommended to maintain space for the permanent successor. Space maintenance can be done with either fixed or removable appliances.

Aim: This work considers the indications for space maintenance and suggests guidelines on the appropriate use of space maintaining appliances with respect to the soft tissue, adjacent teeth, pain, plaque accumulation, and caries. Both orthodontic and paedodontic viewpoints are considered.

Methods: The literature is reviewed from 2000 until now, searching words were 'dental space maintainers' articles published from 2000/1/1 to 2011/3/1 were considered. Clinical cases from Aalborg Municipal Dentistry are presented.

Conclusion: There is limited evidence to recommend either for or against the use of space maintainers. The decision of the use of space maintainers/or which space maintainer should be taken by balancing the potential occlusal disturbance against the potential plaque accumulation and caries risk that the appliance may cause. The dentist's practical experience and the cooperation of the child are important as well. Follow-up and control is important to consider the timing of removal of the space maintainer.

P01-21

An audit to determine if the current timing of referrals for the management of ectopic maxillary canines are appropriate in the MID Yorkshire NHS Hospital TrustS. BARBER¹ & J. SPENCER²

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Aim: Audit to establish if the timing of current referrals for ectopic maxillary canines to an Orthodontic Department are appropriate. Standards used were based on guidelines regarding management of ectopic canines provided by the Royal College of Surgeons UK, Faculty of Dentistry (2010). Referral should be made when ectopic canine first suspected: Age 10–13 years depending on dental development or within 12 months of contra-lateral canine erupting 90% of patients should fulfil criteria, accepting that there are irregular dental attenders who present late to their dentist.

Design: Prospective data collection from all patients referred to the department and identified as having one or both ectopic maxillary canines.

Results: Data was collected between October 2009 and June 2010 with a total of 59 patients. Significantly the timing of the referral was appropriate for only 24 (40%) of patients; for the remaining 35 patients the referral was considered late.

Conclusion: There are concerning delays in recognising and referring patients for the management of ectopic maxillary canines. This can impact the length, complexity and success of treatment, as well as increasing the risk of associated pathology. Action has been taken to improve dentists' understanding of diagnosis and management of canine ectopia, to ultimately improve referral timing: Presentations at local meetings and courses, written information

for all referring practices and e-learning packages for dentists to complete and gain verifiable CPD hours. Re-audit due in 18 months; this will allow time for any current patients who are older than the ideal age to be identified and managed.

P01-22

Case report: extracted carious first permanent molars, an orthodontic approachA. RONTOGIANNI¹, E. D. BERDOUSES² & C. J. OULIS²

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Introduction: Previous studies have suggested that the first permanent molar is the most caries prone tooth to permanent dentition. More than 50% of children over the age of 11 years have some caries experience in this tooth. Orthodontic cases involving the extraction of the first permanent molars are usually more technically demanding compared with conventional premolar extraction or non-extraction treatment. However, it could be said that many patients would benefit from extraction of damaged first permanent molars due to their questionable long-term prognosis.

Case report: Patient, young girl eleven and half years old, with damaged lower first molars from caries came by referral of her dentist. The girl had class I skeletal pattern, hyperdivergent with functional shift and a prognathic mandible. The treatment plan chosen included the extraction of the lower first molars and the retraction of the second molars on their place by applying fixed appliance orthodontic treatment.

Comments: Compromised first permanent molars with poor long term prognosis are commonly associated with both short and long-term clinical dilemmas. Numerous clinical and radiographic factors must be carefully evaluated. The need for compensating and balancing extractions, and the timing of any required extractions, can differ greatly according to (i) the dental development of the patient, (ii) the amount of intra-arch crowding, (iii) the skeletal and buccal segment relationships, (iv) the amount of anterior overjet and overbite.

P01-23

Diagnosis, prognosis and management of impacted maxillary canines. Three non-consecutive cases

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Introduction: Management of impacted maxillary canines requires in most cases a surgical and orthodontic approach for optimal outcome. Three non-consecutive cases are presented with special emphasis on surgical, periodontal and orthodontic considerations. Additional, diagnosis, prognosis and surgical management as well as possible sequelae are highlighted.

Case report: Case 1 presents a 16 year-old female with bilateral buccally maxillary impacted canines and congenital missing laterals. An open eruption technique is utilized with immediate bonding of orthodontic steel brackets. Case 2 presents a 13 year-old male with unilateral palatal impacted canine. A closed eruption technique with immediate bonding of a gold chain is employed. Case 3 presents a 17 year-old male with multiple impacted teeth. Extraction of the canine is performed. This case is emphasizing the diagnostic workup including 3d imaging.

Comments: The different parameters influencing the therapeutic approach and outcome are discussed.

P01-24

Management of bonding complications due to dentinogenesis imperfecta during orthodontic treatment

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Introduction: Dentinogenesis imperfecta (DI) type II is a hereditary malformation of the dentine that affects both primary and permanent dentition. Dental manifestations include grey or amber tooth discoloration, pulpal obliteration, short roots and bulbous crowns. Due to weak dentine structure enamel may be lost rapidly after eruption leading to tooth wear, fractures and loss of vertical dimension.

Case report: A 10 year-old female was referred to the Department of Orthodontics Dental School, University of Athens for orthodontic treatment. Clinical and radiographic evaluation revealed amber discoloration of all permanent teeth and pulp canal obliteration which confirmed the diagnosis of DI type II. In addition the patient presented dental and skeletal features of class III malocclusion. Treatment plan included covering of all affected dental surfaces with composite veneers prior to the brackets bonding in order to enhance their adhesion and prevent tooth fractures.

Comments: DI is a rare hereditary disorder and requires multidisciplinary approach for complete dental management. Pediatric dentists should contribute to the orthodontic treatment with the application of an individualized preventive program and full coverage restorations to prevent tooth fractures and wear.

Poster Session P02/Cariology 1

P02-25

Prevalence of permanent tooth erosion due to 'cuka pempek' Indonesia traditional dietary vinegar in children

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Background: Consuming dietary acids such as 'cuka pempek' (traditional vinegar from Palembang, South Sumatra, Indonesia) habitually may cause the loss of hard dental tissue called tooth erosion.

Aim: This study is aimed to find out the prevalence of permanent tooth erosion in Palembang children who habitually consume 'cuka pempek'.

Design: This was a descriptive study. The sample consisted of 55, 14 years-old children who habitually consumed 'cuka pempek'. The examination to assess tooth erosion was done by using a modification of the Tooth Wear Index (TWI) by Smith and Knight.

Results: 88.6% of the children had erosion in the permanent dentition of different severity as found by the Tooth Wear Index.

Conclusions: Dietary acid in 'cuka pempek' affects the permanent teeth as shown by the high percentage of children who experience tooth erosion.

P02-26

Relationship between oral hygiene habits and salivary F-concentrations in infants

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Background: The caries preventive effect of fluoride is well known, so that many fluoridated products are used from the low age child.

Aim: The aim of this study was to assess the relationship between infant oral hygiene Habits and salivary fluoride (F) concentration.

Design: Sixty-eight children (26 boys and 42 girls), ages 4–6 years, participated in this study. The subjects received dental examinations by a dentist. A questionnaire was completed by the children's parents. The questionnaire investigated the oral hygiene practices, frequency of the use of tooth paste, amount of tooth paste used etc. Stimulated saliva samples were collected. An apparatus for flow injection analysis (FIA) with F-selective electrode was used to determine the fluoride ion concentrations in the saliva. Student's *t*-test, ANOVA and Spearman's correlation were used to perform a statistical analysis of the results.

Results: The mean (SD, min-max) of the salivary F concentration was 0.0083 ppm (0.0026, 0.0035–0.018). A significant correlation was observed between the salivary F concentration and the frequency of tooth brushing by guardians ($r_s = 0.27$, $P < 0.05$). The group with ≥ 2 times tooth brushing by guardians per day had a significantly higher F concentration than the ≤ 1 group ($P < 0.05$).

Conclusions: These results suggest that there is a relationship between the fluoride concentration in saliva and the tooth brushing frequency. In addition, the detection limit of FIA was very low, and thus the investigation of normal values of F concentration in saliva was found to be possible.

P02-27

SEM analysis of dentin surface of primary teeth treated by Er:YAG laser

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Aim: To observe the morphology in deciduous teeth of the cavity surface by scanning electron microscope (SEM) after *in vitro* cavity preparation in deciduous teeth using different power parameters of Er: YAG laser.

Design: Eight cavity-free primary molars with intact crowns were collected and placed in 0.9% saline, stored in 4°C. Class 2 cavities 2 mm deep in the dentin at the occlusal surface were prepared on them. Two of them served as the control group and were prepared using traditional handpiece MANI DIA-BURS BR-S46 (Mani Inc., Japan). The other Six were prepared by Er: YAG laser therapy instrument (DEKA Smart 2940D; Electronic Engineering Corporation, Italy, two in each experiment group 1: Er:YAG laser 10 Hz 200 mJ; group 2: Er:YAG laser 10 Hz 300 mJ; group 3: Er:YAG laser 10 Hz 400 mJ. Samples were then processed and cavity surface morphology was observed under SEM to detect open, melting or crack etc. of the dentinal tubules.

Results: SEM found that laser cavity preparation in primary teeth using different parameters left no smear layer and the dentinal tubules were clear. Dentin melting was not detected after cavity preparation using 10 Hz 200/300 mJ lasers, while visible dentin melting and cracks was detected using 10 Hz 400 mJ laser.

Conclusions: Cavity preparation in primary teeth using 10 Hz 200/300 mJ lasers is effective and safe for the removal of hard tissue. The high power Er:YAG laser 10 Hz 400 mJ would damage the dentin surface when used on primary teeth.

P02-28

Development of monoclonal antibody against glucosyltransferase D of *streptococcus mutans* GS 5

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Background: *Streptococcus mutans* produce glucosyltransferase, GtfB, GtfC and GtfD which contribute to the formation of dental plaque is implicated as a major etiological agent in human dental caries. A number of researches suggest that the N-terminus of glucosyltransferase is important for the role of their enzymatic activity which produces glucans from sucrose.

Aim: In this study we generated monoclonal antibody against the N-terminus of *S. mutans* glucosyltransferase D (anti-GtfDN antibody).

Design: To obtain anti-GtfDN monoclonal antibody, the N-terminus of *gtfDN* (about 2 kb) was inserted into pQE30 vector and the expressed protein (about 75 kDa) was purified and injected into BALB/c mice.

Results: We established three hybridomas (HDN9, HDN11 and HDN28) producing anti-GtfDN antibodies through ELISA, dot blot and western blot. Monoclonal antibodies were purified using affinity column and it was confirmed that they specifically reacted with GtfDN protein.

Conclusions: Inhibition of the attachment of *Streptococcus mutans* to the surface of tooth by the anti-GtfDN antibodies and their possibility as good candidates for the development of vaccines for preventing the formation of dental plaque and dental caries should also be examined in further study.

P02-29

Identification of serotypes F and C *streptococcus mutans*, salivary mucin MG2 level, and the interaction level of mucin mg2 in predicting deft

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Background: Dental caries has been a major children health issue in Indonesia. The number of Baby Bottle Tooth Decay patients in Jakarta and its surroundings is quite high that showed by the proportion of the child patient suffering from the disease (95%). deft registration using the WHO caries criteria can be used only when children has teeth.

Aim: The need of supportive instruments as an alternative to clinical examination to estimate the risk of caries occurrence, especially in children who habitually use nursing bottles under the age of 2 years that have no teeth yet or have some of it. It can be used as a reference in dental health education efforts towards the parents.

Design: Four examination models were constructed. The first model is clinical examination by recording dept using the WHO criteria. The second model is by only checking the salivary mucin MG2 level of children who habitually use nursing bottles. The third model is by examining mucin MG2 and c or f serotype *S. mutans* interaction levels. The fourth model is by examining the child's salivary mucin MG2, MG2 and c or f serotype *S. mutans* interaction levels. To determine which of the four models is suited best to predict the number of teeth that will have caries, measurements of their sensitivity and specificity were carried out.

Result: This research result the number of caries prediction table. The Receiver Operator Curve (ROC) value for the first model is 0.9181, for the second model is 0.9429, for the third model is 0.9454 and for the fourth model is 0.9479.

Conclusions: Specific examination using the models show the number of caries can be predicted.

P02-30

Influence of carbonated beverage and soft beer on enamel micro hardness of primary teeth

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Background: Excess consumption of carbonated drinks and acidic food is the most common etiologic factor in human dental erosion.

Aim: The aim of this study was to determine the effect of the mostly consumed carbonated beverage and soft beer in Iran on the micro hardness of enamel of primary teeth.

Design: In this experimental study, 30 extracted human primary canine free of crack, caries, wear and hypocalcification were randomly divided into three groups. The before exposure micro hardness of the teeth were measured. Then each group was exposed to one of the fresh drinks, carbonate beverage (Zamzam cola), soft beer (Behnoosh lemon delester), and tap water for 5 min. The exposed surface was the same in all the samples (a 5 × 5 mm square of the distal surface). The amount of drinks per sample was the same (40 ml). At the end of the exposure period, the micro hardness of the teeth were measured again. Micro hardness changes in each group were analyzed by paired t-test and those between groups were analyzed by one way ANOVA.

Results: Tap water did not have any significant effect on the enamel micro hardness. Primary micro hardness of enamel after immersion in soft beer (Behnoosh lemon delester) and carbonate beverage (Zamzam cola) decreased 13.3% and 18.1% respectively. There was a statistically significant difference between the amounts of reduction of the enamel micro hardness for each beverage ($P = 0.001$).

Conclusions: Reduction of micro hardness of primary teeth enamel after exposure to Zamzam cola was more than Behnoosh lemon delester and this difference was statistically significant.

P02-31

In vitro* comparison of conventional x-ray film and digital radiography for primary teeth caries detection**A. ORHAN¹, K. ORHAN², S. AKSOY², H. AVSEVER³, M. ICEN² & K. GUNDUZ⁴¹*Division of Paediatric Dentistry, Ministry of Health, 75th Year Ankara Oral and Dental Health Centre, Ankara, Turkey;* ²*Near East University, Department of Oral, Teeth and Jaw Radiology, Mersin, Turkey;* ³*GATA, Dental Sciences Center, Department of Oral, Teeth and Jaw Radiology, Ankara, Turkey;* ⁴*Ondokuz Mayıs University, Faculty of Dentistry, Department of Oral, Teeth and Jaw Radiology, Samsun, TurkeyBackground:** Proximal and occlusal caries detection in primary teeth is of great importance because of the rapid rate of caries progression due to peculiar morphologic characteristics.**Aim:** The aim of the present study was to assess the efficiency of F speed intra-oral x-ray film, phosphor plate system (SPP) and a charge-coupled device (CCD) receptor for proximal and occlusal caries detection of primary molars.**Design:** Sixty-four extracted human primary molars with natural occlusal and proximal caries were radiographed with Vista Scan Perio, Planmeca CCD and Kodak F speed x-ray film at 60 kV and 0.032, 0.064, 0.080 exposure times. The presence or absence of caries was scored according to a five-point scale by three observers. True caries depth was determined by histological examination. The diagnostic accuracy of each radiographic system was assessed by means of a receiver operating characteristic (ROC) curve analysis.**Results:** No significant difference was found according to exposure time for the detection of primary caries ($P > 0.05$). The statistical analysis of Az scores exhibited no significant difference for the imaging modalities ($P > 0.05$). CCD and F-speed film had higher accuracy than Vista Scan Perio phosphor plate system. There was no statistically significant difference between inter-observer agreements ($P > 0.05$).**Conclusions:** The performance of digital receptors was similar to each other. The digital systems can be recommended for pediatric dental clinics with lowest kV tube potential setting, with lower exposure time because of less radiation exposure to child and the elimination of chemical processing.

P02-32

Correlation of salivary *Streptococcus mutans* and severe early childhood caries

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*Taichung Veterans General Hospital, Taiwan***Background:** Dental caries is the single most common chronic disease of childhood. The mechanisms of dental caries are complex and are triggered at various levels. The detection of mutans streptococci and lactobacilli in children were correlated with the development of caries. The acquisition of these organisms in young children is only partly described and is ill understood ecologically.**Aim:** The purpose of this study was to evaluate the correlation of salivary *Streptococcus mutans* (SM) and severe early childhood caries (SECC).**Design:** The study population comprised children age from 3 to 5 years attending the Pediatric Dental clinic of TCVGH in Taiwan. Information on oral hygiene and dietary habits, oral health behaviors and sociodemographic variables were collected using questionnaires completed by the parents. Clinical examinations were performed, and unstimulated salivary samples were collected. The Pearson correlation coefficient and logistic Regressions analysis were used to identify the correlation of SM and severity of the caries.**Results:** A total of 76 children (47 boys, 29 girls) with a mean age of 4.5 years participated in this study. The mean deft was 8.0 for boys and 7.9 for girls. The salivary test showed that 27.7% of children had a SM level higher than 10^6 and 32.3% of children had a SM level lower than 10^4 . The caries rate was significantly correlated with salivary SM level in these children. The higher the salivary SM level the more severe the caries in children.**Conclusion:** The salivary SM level in young children is significantly correlated with the caries severity.

P02-33

Relationship between severe early childhood caries and body mass index in 2–4 years aged children

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*International campus of Tehran, University of Medical Science, Tehran, Iran***Background:** According to some researches, the presence of S-ECC is associated with the children body mass index (BMI); no definitive documentation has been shown in this regard.**Aim:** The aim of the study was to assess the relationship between severe early Childhood caries and body mass index in 2–4 years aged children.**Design:** In this case-control study, 300 S-ECC infected and 300 S-ECC free children (as a control group) were selected from Tehran kindergartens and studied by means of examinations and a questionnaire. Demographic data, height, weight, BMI index, nutrition behavior, milk consumption and the way to drink it were determined in the children and the prevalence of S-ECC was calculated regarding different factors. The data were subjected to chi-square and logistic regression tests.**Results:** Gender, nutrition type in the first 2 years of life, the way of drinking the milk and having special nutritional habits significantly affected the involvement of S-ECC. Significant differences were noted regarding BMI index of two healthy and S-ECC infected children.**Conclusions:** Under the study limitations, no significant relationships were noted between body mass index and presence of severe early childhood caries so that S-ECC frequencies were increased with the enhancement of BMI in some cases while it decreased in some other cases. Therefore, more studies are recommended in this regard.

P02-34

Dental health in children as a paediatrician's problem

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Background: Dental status is a very important part of nutritional status in children, and many pediatric diseases are closely related to dental diseases.

Aim: The purposes of this study were: (i) To determine dental health status and prevalence of caries in school children (aged 7–15 years) in our area and (ii) To stress the role of pediatrician in the screening of dental diseases in children.

Design: A dental health survey was performed in a group of 250, including dental examination and oral hygiene practices has been done.

Results: The prevalence of dental caries in this screening sample was 74.0% and only 26.0% was caries free. The majority of children (68%) had never seen a dentist. There were no difference between frequency of caries in female and male children, but caries was more prevalent in children from urban in relation to children from sub – urban areas. In relation to tooth brushing, the analysis showed that only 18.0% of the children brushed their teeth regularly (more than one), 29.0% of them once a day, 35.0% rarely (once or twice a week) and 17.0% never. Results of this study clearly show that a substantial number of schoolchildren suffered from dental caries, which is mainly revealed by the pediatrician.

Conclusions: Dental caries in children is not only a dentist's problem. Very often, such in this survey, the pediatrician is firstly paced with dentistry diseases, especially dental caries. So, pediatrician's role in screening of caries in children is a very important one.

P02-35

Evaluation of bacterial numbers of *Streptococcus mutans* in saliva specimens from Japanese children

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Background: Several recent studies have shown that the incidence of dental caries in Japanese children is showing a decreasing trend, though few have investigated factors related to that reduction.

Aim: In the present study, we determined the bacterial numbers of *Streptococcus mutans*, known to be a primary causative agent of dental caries, in saliva specimens obtained from children.

Design: Following approval of the study from the Ethics Committee of our institution, 545 children (268 boys and 277 girls; 1.75–12.9 years-old) who visited our clinic from 2006 to 2010 were analyzed, with the results divided by year. Saliva specimens were

collected from each subject, then diluted and inoculated onto Mitis-salivarius agar plates containing bacitracin for isolation of mutans streptococci. After anaerobic incubation for 48 h at 37°C, the numbers of colonies on the plates were counted using a microscope.

Results: Of the 545 children studied, saliva specimens from 159 (29.2%) had no *S. mutans* colonies observed on the plates, though dental caries were detected in 62 of those subjects (39.0%). The rates of children with no *S. mutans* detected on the plates analyzed in 2006, 2007, 2008, 2009, and 2010 were 19.6%, 25.2%, 22.8%, 45.5%, and 40.8%, respectively.

Conclusion: Our results suggest that the number of Japanese children harboring *S. mutans* has recently shown a decreasing tendency, indicating that other cariogenic pathogens might be associated with dental caries occurring in those children.

P02-36

Distribution of *Streptococcus mutans* with collagen-binding properties

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Background: *Streptococcus mutans* is an etiologic agent of dental caries and occasionally isolated from the blood of patients with infective endocarditis. Recently, two types of collagen-binding proteins, Cnm and Cbm, have been reported in *S. mutans*.

Aim: The aim of the present study was to investigate the distribution of *S. mutans* strains with Cnm and Cbm in the oral cavity.

Design: We analyzed 580 *S. mutans* strains in our laboratory stocks previously isolated from the oral cavities of 320 Japanese, 150 Thai and 110 Finnish healthy subjects. Primer sets for detection of *cnm* and *cbm*, encoding Cnm and Cbm, respectively, were designed based on the nucleotide alignments of those genes registered in the database, after which the sensitivity of our PCR method was confirmed. In addition, analysis of the distribution of these strains in 119 saliva specimens collected from Japanese children and adolescents was performed.

Results: The distribution rates of strains with Cnm and Cbm were approximately 10% and 2%, respectively. Cnm-positive strains were predominantly identified among serotype *f* strains, whereas Cbm-positive strains were frequently detected in the serotype *k* group. As for the PCR method constructed in the present study, the detection limit was approximately 10–100 cells per reaction. Analysis of the saliva specimens revealed 80 *S. mutans*-positive specimens, of which 13 (16.3%) and 1 (1.3%) were positive for *cnm* and *cbm* respectively.

Conclusion: Individuals harboring *S. mutans* with collagen-binding properties may comprise approximately 10–20% of the general population.

P02-37

Microleakage and shear bonding strength of sealants using four different application protocols

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Background: Association between retention of a sealant and caries-preventive effect has been described in many studies. The retention rate of a sealant is related to the quality of the bond between the resin material and the enamel.

Aim: The purpose is to compare microleakage and shear bonding strength of sealants using four protocols.

Design: Eighty extracted sound molars were used. The specimens for each group were as follows.

After thermocycled, Group A was tested for the shear bond strength and B was measured for the degree of microleakage. The data were analyzed following the SPSS procedure, ANOVA test and each was complemented to post-analysis using 0.05 significant leveled Tukey test.

Results: No difference was found between Group A-2, A-3 and A-4 ($P > 0.05$), but A-2 and A-3 showed higher shear bond strength than that of A-1 ($P < 0.05$). The lowest average of microleakage was in B-2 and increased average in B-1, B-3, and B-4.

Conclusions: Self-etch adhesives are potentially attractive because of the easier clinical protocol, provided that they have similar bond strengths compared to other products. All-in-one system are regarded as an inappropriate bonding agent for pit and fissure sealant because they have a lower level of bonding strength and higher microleakage than other bonding agents.

Table.

Microleakage		Bonding agent	Shear Strength	Bonding	
Group A ($N = 40$)	A-1 ($N = 10$)	Phosphoric acid	Group B ($N = 40$)	B-1 ($N = 10$)	Phosphoric acid
	A-2 ($N = 10$)	Adper TM Single Bond TM		B-2 ($N = 10$)	Adper TM Single Bond TM
	A-3 ($N = 10$)	Clearfil SE bond		B-3 ($N = 10$)	Clearfil SE bond
	A-4 ($N = 10$)	Adper TM Prompt TM L-pop		B-4 ($N = 10$)	Adper TM Prompt TM L-pop

P02-38

Evaluation of a new QLF device in the detection of incipient occlusal caries lesions

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Background: Nowadays early detection of incipient caries lesions is of importance. Indeed, the caries detection tools are necessary to record and monitor lesions as well as to demonstrate high reliability. Recently new diagnostic tools based on tooth fluorescence have been introduced.

Aim: This *in vitro* study evaluated the performance of a new Quantitative Light Fluorescence (QLF) device in detection of incipient occlusal caries.

Design: Thirty-eight freshly extracted posterior teeth with initial non-cavitated occlusal caries were subjected to clinical examination (CE) and coding according to ICDAS II criteria. Standardized QLF images were taken with Vista Proof (Kavo, Germany). Furthermore, the teeth were calculated with a Laser Diagnodent pen device (LFpen) (Kavo). In all diagnostic methods, assessment of caries was performed twice (with 1 week interval) by two calibrated examiners. Finally, the caries lesions were validated in tooth sections by histological examination. The intra-examiner and inter-examiner kappa coefficient, sensitivity and specificity were determined for all diagnostic methods at D1 threshold (enamel lesions). Degrees of agreement of each method with the histological status were calculated using receiver operating characteristic (ROC) statistics and the area under curve (Az values).

Results: The kappa intra-examiner/inter-examiner coefficient values (mean \pm SD) were $0.74 \pm 0.04/0.73 \pm 0.07$, $0.87 \pm 0.04/0.82 \pm 0.07$ and $0.91 \pm 0.06/0.83 \pm 0.08$ for CE, LFpen and QLF, respectively. The sensitivity was $0.80\text{--}0.86/0.66\text{--}0.75/0.97$ for CE, LFpen and QLF, respectively. The specificity for all tools was 0.5 (0.02–0.99). The Az values (mean \pm SD) were $0.567 \pm 0.183/0.460 \pm 0.147/0.662 \pm 0.190$ for CE, LFpen and QLF, respectively.

Conclusions: All diagnostic methods presented high inter-examiner and intra-examiner agreement. The QLF device presented the best sensitivity, while LFpen showed the worst one. Specificity was the same for all diagnostic tools. Moreover, all diagnostic modalities presented the same validity at D1 threshold.

P02-39

Yeasts of candida genus in dental plaque of ECC-affected children

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Background: The yeasts of the *Candida* genus represent an important part of the normal oral microflora, including dental plaque. Their ability to produce organic acids during the fermenta-

tation of carbohydrates participates in the cariogenic effect of dental plaque.

Aim: The study aims to evaluate the occurrence of yeasts, especially *C. dubliniensis* in dental plaque samples obtained from children affected by Early Childhood Caries (ECC).

Design: In this study, 240 samples from patients suffering from ECC and 255 samples from healthy children were examined. Phenotypic methods (chlamydospore formation, characteristic growth on CHROMagar Candida and Staib Agar, growth at 45°C and latex agglutination) and the genotypic method (PCR with the species-specific primer pair targeted to *act1* intron and universal primer pair) were used for the differentiation between *C. dubliniensis* and *C. albicans*.

Results: We isolated 167 yeast strains from patients with ECC (positivity 69.6%) and only 97 yeast strains from control samples (38.0%). The differences in yeast colonization of teeth between the two groups are significant ($P > 0.01$). Of the total amount of 167 yeast strains isolated from ECC samples we identified 31 strains (18.5%) of *C. dubliniensis*. The situation in the control group was different; only two *C. dubliniensis* strains (2.1%) were identified.

Conclusion: The results show that teeth of children with ECC are colonized with yeasts more frequently than teeth of healthy children. *C. dubliniensis* is a frequent part of dental plaque in ECC-affected children in contrast with healthy children.

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P02-40

Influence of bisphosphonates on the fermented content of saliva in children with dental caries

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Background: One of the etiologies of dental caries is the decreased number of mineralizing ions in the saliva.

Aim: To increase the effectiveness of treatment in children with multiple caries.

Design: One hundred and fifty children in the age group of 3–12 years with multiple caries were selected for the study. Sixty children were selected as the control group. Xydiphone was used in complex treatment to regulate the calcium exchange in oral cavity. The results were checked by the activity of different enzymes in saliva, which showed the pharmacokinetics of xydiphone. Tablets were used as 2% solution orally or as application on the skin below the neck.

Results: The pathological changes of enzymes in the saliva decreased under the influence of xydiphone. Activity of alkaline phosphatase and kreatinkinase increased 1.5–2 times, which decreased gradually and later stabilized. Lactodehydrogenase activity also increased two times, but then decreased and stabilized.

Conclusion: Lactic acid plays the main role in the enamel dissolution. The stabilization of the exchange of substances in the mixed but not stimulated saliva in the patients with dental caries is the main aim of pedodontics. Therefore the use of bisphosphonates decreases the prevalence of dental caries and provides more stable physiological conditions in the oral cavity.

P02-41

Oral health in children with phenylketonuria

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Background: Phenylketonuria (PKU) is a genetic disease of autosomal recessive type based on the genetic defect of fermental system when phenylalanine, irreplaceable amino acid, turns into tyrosine that leads to weak-mindedness in children. Today the only treatment method is diet therapy limiting proteins.

Aim: To assess the influence of diet on the oral health in children with phenylketonuria who are taking specific diet therapy.

Design: To determine caries prevalence, CFE index, OHI-S hygiene index and PMA index in 27 children with typical PKU (PA > 4 mg%) who are taking specific diet therapy.

Results: The level of caries prevalence of primary teeth was middle (3.14); the level of caries prevalence of permanent teeth was low (2.18), the average hygiene index in children under six was 2.1 and older than six – 1.7. Prevalence of chronic gingivitis was 52%; non-caries lesions of hard dental tissues were not a sign of phenylketonuria; primary and permanent teeth's eruption were typical for the population studied.

Conclusions: If you follow diet therapy strictly and take care of the oral hygiene this will lead to the low level of caries prevalence in children with PKU. Violation of diet therapy and dietary diversification over time will result in an increase of caries prevalence.

P02-42

Caries prevention of human deciduous teeth by a low power laser – based on a new theory on the acquired acid resistance

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Background: A half century has been passed since Stern found that lased teeth had acquired acid resistance. Recently Hirota (IADR, 2006, 2008, 2010) presented a new theory on the acquired acid resistance and reported human teeth are able to prevent caries by a low power laser, of which energy are lower than those used in therapies such as pain relief.

Aim: The aim was to apply a low power laser to human deciduous teeth.

Design: Twenty human deciduous teeth were used. A semiconductor laser(OSADA) was used: $\lambda = 810 \pm 20$ nm, CW mode, fiber diameter; 600 μ m, distance (specimen-fiber tip); 3 mm, 3, 2, 1, 0.5, 0.3 and 0.1 W for 2 s. The irradiated teeth were cut longitudinally and reduced to about 150 μ m. The specimen were observed by a polarizing microscope, and analyzed by a MDG (RIGAKU) at 50 kV, 200 mA. After the analysis, the specimens were soaked in lactic acid solution (pH = 2.1) and the substances remained unsolved were identified.

Results: Before soaking in the acid solution; diffusely altered regions were observed. In case of 3 W, 2 W irradiation, a mixture of high-temperature phase: α -TCP[Ca₃(PO₄)₂] of HAP[Ca₁₀(PO₄)₆(OH)₂] and semi-high temperature phases: β -TCP, PYR[Ca₂P₂O₇], MET[Ca(PO₃)₂] were identified. Below 1W irradiations, the semi-temperature phases were detected. After soaking in the acid solution; almost all the enamel solved except the laser irradiated altered regions. In the regions remained unsolved, α -TCP, β -TCP disappeared, and PYR, MET were detected predominantly.

Conclusions: These results prove that the low power laser is applicable to clinical fields, which lead surely to open a new way for preventing caries.

P02-43

Clinical applicability, safety and effect of resin infiltration of proximal caries

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Background: Proximal caries comprise a constant problem in clinical dentistry.

Aim: To evaluate the applicability, safety and effect of a new minimal-invasive treatment for proximal caries by infiltration.

Design: Ten dentists in the Department of Preventive and Pediatric Dentistry/University of Greifswald applied the infiltration material ICON[®] (DMG, D) on proximal initial lesions (D1–D3 without cavitation, standardized X-ray) in primary and permanent teeth in 45 patients (24 m, 21f; mean age 17.5 years \pm 6.6). The applicability was evaluated using two questionnaires. The dentist's questionnaire evaluated the medical history, caries experience and risk, time and difficulties of application. The patient's questionnaire evaluated the satisfaction with the procedure regarding time, comfort and complexity. At recalls after one week, six and 12 months, the infiltrated surfaces were assessed for discoloration, marginal adaptation, gingival status and plaque accumulation. The recall ended with oral hygiene instructions, flossing and topical fluoride application.

Results: The results showed good patient's satisfaction with the procedure and time (mean time 22.3 min \pm 4.7) which included rubber dam application and infiltration. In four patients, difficulties with teeth separation, prolonged the infiltration time. In most cases, the dentists reported that infiltration was comparable to the application of a composite filling. At recalls, infiltrated surfaces showed smooth transition to enamel, no discoloration and no inflammatory or allergic signs in the adjacent gingiva. On radiographs taken for 15 patients included till now in the 12-month recall, all infiltrated lesions showed stabilization, indicating arresting of caries.

Conclusion: Resin infiltration may provide a simple, minimally invasive procedure for treatment of proximal initial caries.

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P02-44

Minimal invasive approach for managing ECC

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Background: Minimal Invasive Dentistry (MID) is now mainstream all over practical dentistry. Dental caries must be also managed by changing the ecology of each patient not only by restorative treatment. Especially surgical approach to manage caries in young children is big challenge because of behavioral problems.

Case reports: Seoul Children's Dental Center developed risk assessment tool for young children and applied to practice for about 10 years. In this presentation, the clinical cases managed by medical approach followed up for years will be shown and discussed the cons and pros.

P02-45

Expression of the structural subunits of *Streptococcus salivarius* urease

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Background: Alkali generation from urea by ureases of oral bacterial is of great importance in maintaining pH equilibrium of oral ecology. *Streptococcus salivarius* 57.I is one of the most abundant and highly ureolytic microorganisms in oral cavity.

Aim: To clone, express and purify *ureA*, *ureB* and *ureC* gene respectively, which encode the structural subunits of *Streptococcus salivarius* 57.I.

Design: Genomic DNA of *S. salivarius* 57.I was isolated. The *ureA*, *ureB* and *ureC* were amplified by polymerase chain reactions (PCR) using degenerate primers and then cloned into expression vector pET-32M. The resulted recombinant plasmids were transformed into *E. coli* BL21 (DE3). The corresponding proteins were induced with 0.5 mmol/L IPTG at 24°C for 12 h and subjected to SDS-PAGE analysis to determine its expression and then purified by Ni-NTA affinity chromatography.

Results: *UreA*, *ureB* and *ureC* of *S. salivarius* 57.I were eventually cloned and proved by sequence analysis as well as BLAST search. The corresponding protein was expressed and purified.

Conclusions: The structural subunits of *S. salivarius* 57.I urease were cloned, expressed and purified in the present study. The obtained protein can be used to produce *S. salivarius* 57.I urease-specific antibody for Western blot analysis or vaccine candidate preparation in future functional and structural study.

P02-46

ART versus the hall technique: results after 2 years

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Background: Both the ART approach as the Hall technique are minimal invasive restoration techniques. The success rate of ART restorations can vary considerably, depending on many factors like size of the preparation, operator and location of the study. Of the Hall technique the results are promising, but only a few studies have been done.

Aim: To investigate the survival difference between both restoration techniques.

Design: Children (5–7 years) in the rainforest of Suriname were randomly divided in two groups: the ART or the Hall group. Children in the first group received only occlusal ART restorations (multi-surface restorations were, due to the bad survival rate, not allowed to be made). In the second group PMC's were applied over un-prepared primary molars.

Results: In 255 children 132 PMC's and 98 ART restorations were made. For evaluation 124 and 96 respectively were available. Evaluating only the first placed restorations, the success rate for the Hall crowns was 74.4% and for the ART class I restorations 58.3%. This difference was statistically significant (Mann–Whitney U-test, $P = 0.000$)

Conclusions: In a period of 2 years the Hall technique performs better than the ART approach. It should be noted that the PMC's in the Hall group were placed on primary molars irrespective the location and number of carious lesions, while in the ART group only occlusal restorations were involved.

P02-47

Comparative diagnostic performance of a limited cone-beam volumetric imaging system (CBVI) and intraoral radiography for proximal caries in primary teeth

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Aim: The proximal caries can be diagnosed by the clinical examination, and the presence and its depth is assessed more precisely when coupled with bitewing radiography. A limited cone-beam volumetric imaging (CBVI) system can be expected to be higher in accuracy not only in detection but also in estimation of the lesion depth.

In this study, the accuracy of CBVI was examined using extracted human primary teeth in comparing with conventional intra-oral radiography.

Design: Forty-one extracted primary molars (69 surfaces) were used. The presence and the depth of the lesions were verified using a Micro CT with software to analyze the images. The surfaces were finally classified into six categories. The exposure was performed in simulating the real exposure conditions. The images obtained by both CBVI and intra-oral radiography were examined to determine the presence and the depth of the caries by eight observers.

Areas under the receiver operating characteristic (ROC) curves (Az) for each combination of observer and image modality were calculated and assessed using the Student's *t*-test.

Results: The mean ROC curve (Az) values were 0.949 ± 0.211 for CBVI and 0.945 ± 0.018 for IOR in the detection of proximal caries in primary molars. The Student's *t*-test showed no statistically significant differences between modalities.

Conclusion: A limited CBVI system could not enhance the accuracy in detecting proximal carious lesions in primary molars. The reduction of noise, the enhancement of image contrast, and the reduction of artifact, would be required to improve the performance.

P02-48

Oral hygiene behavior and caries in young Volgograd children

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Background: Good oral hygiene is important for caries prevention, but our information about oral hygiene behavior in young Volgograd children is insufficient.

Aim: To study oral hygiene behavior in young Volgograd children and its connection with caries.

Design: In nine kindergartens 140 children of age 24–35 months (mean age 29.5 months) were examined by a trained and calibrated dentist. Parents were questioned about children's oral hygiene behavior. After 2 years 126 (90%) children (mean age 48.3 months) were re-examined by the same dentist. Index d3-

4mft (mean \pm standard error) was calculated. The study was approved by The Volgograd Regional Ethic Committee; the parents' inform consents were obtained.

Results: Prevalence of various children's oral hygiene behavior were: without toothbrushing (WTB) – 17.1%, toothbrushing not daily (BND) – 38.6%, one daily self-brushing (1SB) – 17.1%, two (2SB) – 12.9%, one daily tooth brushing by parents (1BP) – 5.7%, two (2BP) – 8.7%. The children WTB and BND have the highest d3-4mft indexes at baseline (1.33 ± 0.43 and 1.09 ± 0.24) and after 2 years (5.00 ± 0.44 and 2.53 ± 0.29), $P < 0.001$. The children 1PB and 2PB were caries free at baseline and have the lowest d3-4mft after 2 years (1.25 ± 0.44 and 0.67 ± 0.27). The children 1SB and 2SB have d3-4mft at baseline 0.96 ± 0.38 and 0.83 ± 0.37 , after 2 years 1.91 ± 0.52 and 1.76 ± 0.51 respectively. After 2 years the differences were significant between WTB and others ($P < 0.001$), BND and 1PB, 2PB ($P < 0.05$).

Conclusions: Parents' attention to oral hygiene of young children is insufficient and needs improvement; d3-4mft index in young children depends on oral hygiene behavior.

Poster Session P03/Dental Materials 1

P03-49

Shear bond strength of a solvent free self-etch adhesive to dentine substrates

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Aim: The aim of this study was to compare the shear bond strength (SBS) of a solvent free self-etch adhesive with adhesives containing different solvents.

Design: The systems tested were: a solvent free self-etch adhesive Bond 1 SF (Pentron Clinical), an ethanol self-etch adhesive Futurabond M (Voco), and a water-acetone-ethanol self-etch adhesive Optibond All in One (Kerr), using composite resins from their respective manufacturers. Thirty-six human teeth were sectioned longitudinal to expose superficial dentine and dentine substrates were polished with 600 grit SiC paper. Manufacturers' instructions for bonding were strictly followed. A cylindrical Teflon mould (3 × 4 mm) was placed over the bonded area and filled with composite resin. Twelve specimens were prepared for each material and all specimens were stored in distilled water at 37°C for 24 h. Bonds were stressed in shear at a rate of 0.5 mm min⁻¹ until failure. Mean data values were analyzed by the Welch robust analysis of variance and Games-Howell statistic $P < 0.05$. Failure patterns were analyzed using a stereomicroscope, for determination of the failure modes and samples were processed for SEM evaluation.

Results: Statistically significant differences were found between the three materials (Welch statistic $P < 0.001$). The solvent free adhesive system showed the smaller SBS to dentine. Failures after testing were mainly adhesive failures between the bonding resin and dentine associated with partial cohesive failures in the adhesive resin. SEM findings confirm the results.

Conclusions: Eliminating solvents from adhesives may decrease bonding strength to dentine substrate.

P03-50

Restorations in primary dentition with a nano filled resin modified glass ionomer cement: 12 months results

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Background: Ketac N 100 (Espe) is a new resin modified glass ionomer cement (RMGIC) restorative material incorporating a novel nanofilled technology. The material was introduced with the hope of an improved esthetics and a reduced wear.

Aim: The aim of this randomized controlled prospective clinical study was to evaluate the clinical behavior of Ketac N 100 compared to a classic RMGIC (Fuji II LC; GC) in Class I and II cavities over a period of 12 months.

Design: Thirty-one subjects (16 female, 15 male, average age 4.36 years) received 75 restorations by five dentists (Department of Paediatric Dentistry, Dresden University of Technology): 40 with Ketac N 100 and 35 with Fuji II LC (split-mouth design). Each intervention was carried out under general anesthesia. Thirty-seven restorations were placed in maxillary primary molars, 38 in mandibular primary molars (37 Class I, 38 Class II). Restorations were examined according to modified USPHS criteria at baseline, after 6 months and 1 year. At each recall, impressions were taken for SEM replica analysis (400× magnification).

Results: Recall rate after 1 year was 77%. Cumulative survival after 1 year of clinical service was 93%. No significant differences were found between the restorative materials. A significant decrease in both marginal integrity and restoration sufficiency were found over time ($P < 0.05$). SEM analysis of restoration margins revealed differences regarding the amount of detectable perfect margins in favor of Fuji II LC ($P < 0.05$).

Conclusions: Both materials showed an acceptable clinical performance over the 1-year observation period.

P03-51

Soft tissue application with ozone therapy in children

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Aim: Ozonytron is one of the devices for the generation of ozone. The purpose of this study was to assess the benefits of ozone in some pathological conditions in children.

Design: Ozone therapy was applied in 17 patients, including three with lip herpes, ten after dental surgery and four with aphthous stomatitis. GI prob was used for aphthous stomatitis and herpes labialis. AV 90 prob was used for alveoli after extraction. The intensity of the treatment of apthae and herpes was 2–3 and duration of application was 30 s in each visit during two weeks follow up.

Results: Treatment with Ozonytron is a noninvasive and painless option for children. The reliable antibacterial and antiviral properties of ozone therapy make it an important disinfectant in dental practice. Following ozone therapy, a better soft tissue healing was observed in each case.

Conclusions: Our preliminary clinical experience with ozone therapy device has given us positive results, but further clinical and *in vitro* research and comparison with other clinical studies results is needed to provide a more thorough opinion.

P03-52

Elemental characterization of contemporary ag-based soldering alloys

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Background: Ag-based soldering alloys are solely used for joining stainless steel orthodontic wires and bands for the fabrication of orthodontic and pediatric metallic appliances. Although they characterized as Ag-based alloys the elemental composition remain unknown for the vast majority of these dental materials.

Aim: The aim of the present study was the elemental characterization of four Ag-based soldering alloys.

Design: Four commercially available dental brazing alloys with the indication of use in the fabrication of space maintainers were tested in the present study. The commercially available alloys were: Leone R0224-00 (Leone S.p.a., Italy), Ortho Technology silver solder #2020 (Ortho Technology Inc. Florida), Nobil Metal Solder LV 15 (Nobil Metal S.p.a. Italy), Dentaurem Universal silver Solder (Dentaurem, Germany). The elemental composition was determined by SEM/EDX analysis operating in area scan mode. The spectra were collected employing 25 kV accelerating voltage, 110 µA beam current and a 70 × 70 µm collecting window and the quantitative analysis were done in a non standard analysis.

Results: The elemental composition after x-ray EDS analysis of alloys tested are presented in Table 1.

Soldering alloy	Ag	Cu	Zn	Al	Mg	Cl
Dentaurem	65.7	13.3	20.5	0.5		
Leone	48.1	22.1	24.3	4.6	0.6	0.3
Nobil metal	66.3	15.5	17.7	0.6		
Orthotechnology	62.3	25.1	10.9	1.6		

Conclusions: Since the tested alloys showed big differences in their elemental compositions it means that significant performance differences are anticipated among the materials tested under clinical conditions.

P03-53

Surface roughness of reinforced glass-ionomer restorative cements

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Background: Recently several new glass-ionomer restoratives with enhanced strength have been introduced. Although mechanical testing has demonstrated improved performance, the surface roughness of the these materials, which is related to wear and plaque retention capacity, has received minimal interest.

Aim: The aim of this study was to investigate the surface roughness parameters of reinforced glass-ionomers.

Design: The materials tested were Chemfill Rock (CR), Fuji IX Extra (FE), Fuji Extra IX + G-Coat Plus (FP), Ketac Molar (KM) and Riva (RV). Specimens (Ø:3 mm, d:2 mm, n:8) were prepared from each material according to manufacturers' instructions and after setting were finished with a fine diamond and Soflex disks, to simulate intraoral finishing and polishing procedures. The 3D roughness of the specimens was evaluated by optical profilometry. The amplitude roughness parameters tested were S_a , S_q and S_z (all in µm). Statistical analysis was performed by one way ANOVA on Ranks and Tukey test (α : 0.05).

Results: CR demonstrated the highest S_a (4.62), S_q (6.44) and S_z (57.27) values followed by RV (S_a : 3.89; S_q : 5.28; S_z : 42.42), but with no statistically significant difference ($P > 0.05$) between the two products. FE showed the lowest S_a , S_q values (S_a : 2.14; S_q : 2.91; S_z) and FP the lowest S_z (31.12), with no statistically significant difference among FE, FP, KM in all the parameters tested. Nevertheless, the differences were significant between CR, RV and FE, FP, KM.

Conclusions: CR and RV demonstrated significantly higher S_a , S_q and S_z roughness parameters in comparison with FE, FP and KM.

P03-54

Electrochemical behavior of commercially available space maintainers' brazing alloys

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Background: Brazing alloys are used for joining the wire and the band during the fabrication of space maintainers. All commercially available brazing alloys are silver based and contain copper.

Aim: To evaluate the electrochemical behavior of four commercially available brazing alloys.

Design: Four commercially available brazing alloys, with the indication of use in the fabrication of space maintainers were studied: Leone R0224-00 (Leone S.p.a., Italy), Ortho Technology silver solder #2020 (Ortho Technology Inc. Florida), Nobil Metal Solder LV 15 (Nobil Metal S.p.a. Italy), Dentaurem Universal silver Solder Ref.380-604-50 (Dentaurem, Germany). The electrochemical behaviour was studied by anodic scan, cycling polarization and electrochemical impedance spectroscopy with a mini cell system in a Ringers solution. A saturated calomel electrode was the reference electrode ($E_0 = 241$ mV versus SHE). Acquisition parameters for anodic scan and cycling polarization were -1 V up to +1.2 V (versus SHE) potential range, 10 mV/s scan rate and 0.008 cm² sampling area. For EIS the frequency range was 70 KHz-10 mHz and wave amplitude 15 mV. The data were collected and analyzed employing Corrware, Corrview, Zview and Origin software.

Results: All the alloys demonstrated negative hysteresis indicating that a passive film can reform itself and pits do not initiate. Dentaurem expressed the lower value of corrosion current and the wider passive region indicating the better corrosion behaviour of the alloys tested.

Conclusions: The alloys tested are prone to corrosion. Taking into account that all the alloys contain copper, their corrosion might be dangerous for the health of children.

P03-55

Effect of one-step self-etching adhesives on the morphology of primary enamel

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Background: One step self-etching adhesives are currently used for treatment of primary teeth.

Aim: The aim of this study was to investigate the effect of these adhesives on the morphology of intact and ground primary enamel.

Design: The self-etching adhesives tested were Clearfil S³ Bond (CS), G-BOND (GB) and iBond (iB). Specimens of ground and intact enamel were taken from buccal surfaces of non-carious exfoliated human primary molars. The enamel specimens were randomly distributed into two series (intact/diamond ground) of five groups (A–E, n: 3) and treated as follows: A:CS, B:GB, C:iB, D:15 s 37% H₃PO₄ liquid and E: no treatment (control). Groups A–C were rinsed off with ethanol and water to remove adhesive residues and group D with water. The specimens were then dehydrated, gold-coated and examined in a SEM.

Results: Lack of the typical acid etching pattern was observed in all specimens of both series treated with the adhesives (groups A–C). Group D demonstrated a type III etching pattern, with the core of the prisms being more affected than the periphery. Groups A and B showed adhesive chemisorption on enamel. Group A demonstrated the highest extent of residual film, group C the lowest and group C showed no evidence of chemisorption. Ground specimens showed a more typical etching pattern than their intact analogues.

Conclusion: The adhesive systems used in this study did not have any typical effect on the morphology of intact primary enamel. On the contrary, phosphoric produced a type III etching pattern.

P03-56

Novel method for the identification and characterization of periopathogens for the early diagnosis of aggressive periodontitis in adolescent patients

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Background: The FT-IR spectroscopy is a non destructive method and infrared signals of microorganisms serve as highly specific fingerprints that can be used in the identification of periopathogenic bacteria.

Aim: The aim of this study was to investigate the most common group of predominantly periopathogenic bacteria that colonize the subgingival plaque of young periodontal patients. For this purpose, Fourier Transform Infrared Spectroscopy (FT-IR) with Attenuated Total Reflectance (ATR) technique was used. Besides, repeated spectra can be taken for the verification of the results.

Design: A number of periopathogenic species of the red complex, was provided from special microbial collection Tables of Sweden and Germany. FT-IR spectra of these species were recorded. Samples of subgingival calculus and gingival crevicular fluid were taken from periodontal patients. Each sample was examined both with PCR (Polymerase Chain Reaction) analysis and FT-IR spectroscopic analysis for detection and identification of the bacteria.

Results: The results of both analyses were nearly identical. In this way the two analyses were compared, with the FT-IR being better and faster.

Conclusions: FT-IR spectroscopy can be applied to characterize microbial environment of subgingival plaque in young patients with periodontal disease, because it can provide information about their bacteria composition. The method is diagnostic and superior to PCR, since it takes much less time for analysis and it shows repeatability potential to frequent and long term following up of the patient.

P03-57

Crown discoloration induced by temporary filling materials. An *ex vivo* spectrophotometric study

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Background: Tooth discoloration is observed in clinical practice after the application of various dental materials.

Aim: To study the chromatic alterations of tooth crowns induced by temporary filling materials.

Design: Fully developed, intact third mandibular molars were randomly assigned in one control ($n = 15$) and four experimental groups ($n = 4 \times 15$). Crowns of the teeth were cross-sectioned 1 mm below the cemento-enamel junction. The pulp chambers were chemomechanically debrided and filled with temporary filling materials (Cavit G, Coltisol F, IRM, SS White Zinc Cement). The spectral reflectance lines were recorded by utilizing a UV-VIS spectrophotometer in the visual spectrum and transformed into values of the CIE $L^*a^*b^*$ color system and ΔE^* by a linked computer software. Validation of the method was performed before the start of the experimental period. Measurements were obtained at baseline, after 1 week, 2 weeks and 1 month. Two-way mixed ANOVA models were used to statistically analyze the data. The level of statistical significance was set at $P < 0.05$.

Results: All materials used caused alterations in ΔE values after 1 week, within the perceptibility threshold. After 1 month ΔE values of IRM group exceeded the perceptibility threshold ($\Delta E > 3.7$, $P < 0.05$).

Conclusions: Spectrophotometry is a valid method for the evaluation of chromatic alterations *ex vivo*. Temporary filling materials cause chromatic alterations of the teeth.

P03-58

Treatment of experimentally infected deep dental cavities with a bacteriostatic adhesive system or calcium hydroxide: a comparative histological studyC. TZIAFA¹, E. KOLINIOTOU-KOUMPIA¹ & S. PAPADIMITRIOU²¹Restorative Dentistry, Faculty of Dentistry, Aristotle University of Thessaloniki, Greece; ²Clinical Sciences, Veterinary School, Aristotle University of Thessaloniki, Greece**Background:** Infection of cavity walls together with material toxicity may be considered as the critical determinants for pulpal reactions after restoration in deep dental cavities.**Aim:** The present study aimed to evaluate comparatively responses of pulp-dentin complex, after placement of a novel antibacterial adhesive system (ABF) or Ca(OH)₂ in infected non-exposed deep dental cavities in dog's teeth.**Design:** Twenty-two class V cavities with a residual dentin thickness <0.8 mm were prepared on the buccal surface of young permanent teeth in three dogs. Millipore filters which had been incubated for 3 h in a 10⁵ milky suspension of *a-streptococci* were placed in the cavities. After 24 h, the filters were removed; 14 cavities of group A were treated with the ABF and eight cavities of group B with the Ca(OH)₂. Teeth were evaluated histologically after post-operative periods of 4 and 8 weeks for tissue alterations and presence of bacteria.**Results-conclusions:** Results submitted to Kruskal–Wallis and to Mann–Whitney *U*-tests showed that there were no significant differences between the two groups of teeth. Positive bacterial staining along the cavity walls or within the cut dental tubules was found in two or 0 teeth of groups A or B respectively.

P03-59

In vitro estrogenicity of dental resin sealantsD. ZAMPELI¹, T. ELIADES², G. ELIADES³, D. KLETSAS⁴ & L. PAPAGIANNOULIS¹¹Department of Paediatric Dentistry, Dental School, University of Athens, Greece; ²Department of Orthodontics, School of Dentistry, Aristotle University of Thessaloniki, Greece; ³Department of Dental Biomaterials, Dental School, University of Athens, Greece;⁴Laboratory for Cell Proliferation and Ageing, Institute of Biology, 'Demokritos' National Center for Scientific Research, Athens, Greece**Background:** Recently dental resinous materials have been targeted as potential sources of xenoestrogens, which mimic the natural steroid hormones and can cause many biologic effects.**Aim:** The purpose of this investigation was to assess the estrogenic action of various types of sealants.**Design:** Three filled light cured sealants were included in this study. Each sealant was applied and photopolymerized in eight polyeth-

ylene moulds according to the manufacturer's instructions. All specimens were immersed in normal saline for 1 week at 37°C. Samples of eluents at concentrations 5% and 10% v/v were tested for estrogenicity by measuring their effect on the proliferation of the estrogen responsive MCF-7 breast cancer cells. In addition an estrogen insensitive cell line was used as control (MDA-MB-231), in order to exclude a possible cytostatic effect of the tested materials. All assays were repeated four times and the results were averaged. The results were analyzed with a two-way ANOVA and further differences were investigated with Tukey's multiple comparison test at the 0.05 level.

Results: Eluents of the sealants tested at concentrations 5% and 10% v/v did not possess estrogenicity, except for the eluent of one sealant at concentration 10%, which caused an induction of the proliferation rate of the MCF-7 cells. The potential causes of this effect and the clinical implications are discussed.

P03-60

In vitro antibacterial activity of four glass ionomer cementF. X. P. C. SIMÕES¹, C. S. R. ALMEIDA¹, C. P. SIMÕES², L. Q. RIBEIRO², M. F. RIBEIRO², C. F. BRANDAO², M. A. V. BITTENCOURT³¹Bahia Southwest University, School of Dentistry Jeque (BZ);²School of Medicine and Public Health, Salvador (BZ); ³Federal University of Bahia, School of Dentistry, Salvador (BZ)**Objective:** To evaluate the 'in vitro' anti-bacteria activity level of four different glass ionomer cement.**Method:** Glass ionomer cement (Vidrion®, Vitremer®, Bioglass® e Maxxion®) and theirs liquids was evaluated on pure saliva stimulated and standard *S. mutans*, *S. sobrinus*, *S. aureus*, *E. coli*, *P. aeruginosas*. A hydroxide of calcium pro-analysis (Biocal®), digluconato of clorexidina 2% and hypochlorite 1% was used as control group, that surely have anti-bacterial action. For this evaluation diffusion method in agar with half of culture Brain Heart Infusion (BHI) agar was used. The plaques were incubated in a stove at 37°C for 48 h. After this period the presence or absence of inhibition halos of bacteriae growth was analyzed.**Results:** Showed that all liquid components of the glass ionomer cements formed inhibition halos over all the evaluated microorganisms and in pure saliva. The cepas of *Staphylococcus aureus*, *Pseudomonas aeruginosas* and *Escherichia coli* was resistant to control solution of the powder calcium hydroxid (Biocal®). Vidrion® didn't inhibit the growth of the cepas of *Staphylococcus aureus* and *Escherichia coli*. The other ionomers researched inhibited microorganism growth.**Conclusion:** Glass ionomer cements have good anti-microbial potential.

P03-61

Roughness of modern composite restoratives

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Background: Various modern composite materials have been introduced based on nano- or nano-hybrid filler technology claiming superior surface quality.

Aim: The aim of the present study was to assess the roughness of modern composites by measuring amplitude, hybrid and functional parameters.

Design: The composites tested were Estelite S Quick (EQ), Filtek Supreme Enamel (FS), IPS Empress Direct (IP) and Premise (PR). Disk-shape specimens were prepared (\varnothing : 4 mm, d: 1 mm, n: 8), irradiated for 20 s with a LED curing unit and polished with the Soflex Polishing system. The polished surfaces were analyzed by optical profilometry for the following 3D roughness parameters: S_a (amplitude arithmetic mean deviation), S_z (10 point amplitude peak to valley height), S_{dr} (developed interfacial area ratio *versus* an ideal area) and S_{ci} (core fluid index, the volume a surface supports from 5% to 80% of the bearing ratio). Statistical analysis was performed by one-way ANOVA plus Tukey test (α : 0.05).

Results: FS demonstrated the lowest values (S_a : 0.36 μ m, S_z : 5.12 μ m) followed by EQ (S_a : 0.60 μ m, S_z : 11.64), PR (S_a : 0.78 μ m, S_z : 17.53) and IP (S_a : 0.82, S_z : 14.82) with statistical rankings S_a : FS < EQ < IP, PR and S_z : FS < EQ, IP < PR. In S_{dr} EQ exhibited the lowest values (4.95) followed by PR (7.8), IP (11) and FS (17) with EQ < PR, IP < FS. For S_{ci} RP manifested the lowest values (1.21) followed by EQ (1.24), IP (1.25) and FS (1.81) with FS, IP, EQ, PR.

Conclusions: Although the amplitude parameters (S_a , S_z) have long been used to characterize composite surface roughness, the hybrid (S_{dr}) and functional parameters (S_{ci}) seem more reliable for biological interactions (biofilm adsorption). It is interesting that the ranking of the materials is not the same in all the parameters tested.

P03-62

Clinical efficacy of direct and indirect posterior composite resin restorations in pediatric dentistry

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Aim: The purpose of this study was to evaluate the clinical effectiveness of indirect posterior composite restorations in the permanent teeth of children that had root canal treatments.

Design: Root canal treatment of 29 patients was completed. Sixteen molar teeth were restored with an indirect composite resin system and 13 molar teeth were restored with posterior composite resin. The indirect dental restorations that were completed after labora-

tory procedures were bonded with dual-cure resin cement. The posterior composite resin restorations were completed in one session. The clinical success of the restorations was evaluated every 3 months for 1 year.

Results: As a result of the clinical evaluation of the restorations at the end of the 12 months according to the USPHS, it was not observed statistically significant differences between the posterior and the indirect composites ($P > 0.05$). When the photos taken of the patients were evaluated, we found that every two composites had an increased staining in marginal edge of the restorations after the third months depending on the time ($P < 0.05$). The posterior composites restored teeth were stained more than the teeth with the indirect restorations as it was shown in the photographs ($P < 0.05$).

Conclusion: In the light of the data obtained from a follow-up period of 12 months in length, the use of indirect restorations in the permanent teeth of children with root canal treatment may be considered beneficial.

P03- 63

Secondary caries inhibition around new fluoride containing restorative materials

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Aim: The aim of this study was to investigate the effect of new fluoride containing restorative materials on inhibition of secondary caries around restorations in enamel.

Design: The materials used in this study were a glass ionomer (Fuji IX, GC), a resin-modified glass ionomer (Ketac N100; 3M ESPE), a giomer (Beautifil II; Shofu) with a fluoride containing adhesive (FL Bond II; Shofu), a compomer (Dyract Extra; Dentsply) with a fluoride containing adhesive (Prime & Bond NT; Dentsply) and a fluoride containing composite resin (Wave, SDI) with a fluoride containing adhesive (Stae, SDI). Class V cavities prepared in enamel of bovine teeth and restored with the above materials. The restored teeth were thermocycled and stored in saline solution, in 37°C, for 30 days and subjected to artificial caries challenge (pH cycling, 6 h demineralization in pH = 4.4 and 18 h remineralization in pH = 7), for 15 days. The teeth sectioned with hard tissue microtome and examined by means of polarized light microscopy and measured the enamel lesion depth (0, 100, 200 μ m from restoration). One-way ANOVA and Bonferonni *post hoc* test were performed to compare mean values of lesion depth between materials.

Results: The results indicated that glass ionomer had significant less enamel lesion depth than all the other materials, followed by resin-modified glass ionomer, compomer, giomer and fluoride containing composite resin ($P < 0.05$). The degree of protection for all fluoride-releasing restorative materials was greater near the restorations ($P < 0.05$).

Conclusions: All fluoride-releasing materials reduced the susceptibility of enamel in demineralization but in different extent.

P03-64

Adhesive procedures in primary teeth: *in vitro* evaluation of adhesion forces of three different materials

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Background: Simplification of restorative steps is crucial in paediatric dentistry. Development of new materials has contributed to that goal, specifically 6th and 7th generation adhesives, which eliminate etching altogether. Although these adhesives have been thoroughly studied in permanent dentition, research concerning primary teeth is scarce.

Aim: Evaluation of the dentine bonding strength of three different adhesive materials in primary teeth: one self-etch adhesive, one self-etch flowable composite resin and one etch & rinse adhesive.

Design: Our sample consisted of 30 caries-free primary molars, randomly divided into three groups, according to the adhesive material tested: group 1-Xeno[®]V, group 2- VertiseTMFlow, group 3-XP Bond[®]. After sample preparation (composite cylinders adhered to flattened dentin surfaces treated with the three different adhesive materials), shear bond strength was measured using a universal testing machine (Shimadzu AG-I) at a cross-head speed of 1 mm/min. Data were analyzed using ANOVA and multiple comparison of Tukey's range test ($P \leq 0.05$).

Results: The mean shear bond strength in MPa and standard deviations for the tested groups were: group 1- 8.73 (± 1.61); group 2- 7.04 (± 3.06); group 3- 10.23 (± 1.23). There was no statistically significant difference in bond strength between Xeno[®]V and XP Bond[®]; VertiseTMFlow however, presented reduced bond strength when compared to the other two materials.

Conclusions: Concerning bonding strength, simplified, less sensitive, self-etching adhesive, may represent a significant alternative in pediatric dentistry, compared to an etch & rinse adhesive, but this does not apply to self-etch flowable composite resin.

P03-65

The effect of bonding agents on the microleakage of sealant following contamination with saliva

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Background: A Concerning issue in dentistry is lack of adhesion and proper sealing following restoration of tooth that can lead to marginal leakage.

Aim: The aim of this study was to examine the effect of a bonding agent on the microleakage of a sealant material following contamination with saliva.

Design: According to the experimental research design, 48 sound premolar cases divided in two groups. The group one was sealant without bonding and another group was sealant with bonding. Teeth after prophylaxis etched with 37% phosphoric acid gel then

fresh human saliva placed for 10 s on occlusal surface. After saliva application, in the group one, fissure sealant (kerr) was applied directly and in the group two, sealant after bonding (single bond/ 3 M) was applied and cured. The teeth were thermocycled (500 cycles; 5 and 55°C, dwell time of 30 s) and silver nitrate was used as leakage tracer. Then teeth were sectioned. Microleakage evaluation was made by stereomicroscope at 40× magnifications and results were evaluated with Mann-Whitney *U*-test.

Result: In the sealant group without bonding an extensive microleakage seen and placement of the sealant with bonding significantly reduced microleakage.

Conclusion: Use of bonding under fissure sealants upon saliva-contamination is beneficial for microleakage reduction.

P03-66

Effect of a sonic dispenser on setting shrinkage and porosity of composite restorations

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Background: A major problem of modern resin composite restoratives is the setting shrinkage and the porosity developed when medium and high viscosity materials are placed in dentin cavities.

Aim: To assess whether a sonic vibrating dispensing gun can reduce composite setting shrinkage and porosity.

Design: The composites tested were Clearfil AP-X (CL), Esthet-X HD (EH), Filtek Silorane (FS), Gradia Posterior (GP), Tetric Evo-Ceram (TE), Venus (VE) and XRV Herculite (XR), all in compules. The dispensing gun used was the Compulz. Two specimen groups were prepared with (group A) and without (group B) sonication. The setting shrinkage strain of the materials (%S) was evaluated by the bonded disk method (n:5 per group, 20 s exposure to a halogen unit at 850 mW/cm² intensity). For the cavity adaptation test, dentin cavities (Ø: 2.7 mm, d: 2 mm, n: 5 per group) were prepared filled with the composites, light-cured and the void volume (%Vv) of the restoratives (shrinkage gaps and pores) of the two groups were measured by computerized X-ray microtomography. Statistical analysis was performed by one-way ANOVA plus Tukey test ($\alpha: 0.05$).

Results: All sonicated specimens (Group A) showed a reduction in %S (-3.38 up to -12.44%), with statistically significant differences found in CL, GP and XR. Sonicated specimens demonstrated a reduction in %Vv (-7.63 up to -34.28%), with statistically significant differences registered in CL, FS, GP, TE and XR. The %Vv reduction in CL, FS and TE was the greatest (-22.82 up to -34.28%)

Conclusion: Sonication of composites with Compulz strongly reduced restoration porosity in most of the materials tested. In addition, setting shrinkage strain was reduced in some composites. These results are rather attributed to the reduced composite paste viscosity from the vibrating energy of the sonic probe of dispensing gun.

P03-67

***In vitro* investigation of the surface characteristics of teeth before and after 'nanofluor' varnish application**

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Background: Nanofluor is a fluoride varnish in which a combination of amino and sodium fluoride provides high fluorinating effect, nanodispersed colloidal hydroxyapatite promotes remineralization, and the combination of natural resins and solvents promotes deep penetration into cracks, dentinal tubules, etc.) The use of varnish in the clinic quickly and long lasting reduced the sensitivity of the teeth.

Aim: To study the surface characteristics of primary and permanent teeth before and after application with varnish 'Nanofluor'.

Objects: Teeth which were extracted due to physiological root resorption or for orthodontic reasons. Part of them was covered with 'Nanofluor' (To obtain scans the surfaces atomic force microscopy INTEGRA AURA (NT-MDT) was used.

Results: Tooth surfaces had many cracks which are not detected on clinical examination of the tooth. On the teeth covered with 'Nanofluor', deep penetration of the varnish into surface pores was detected. The varnish was strongly retained on the tooth surface.

Conclusions: 'Nanofluor' has the ability to deep penetrate into the micro-and nano-pores, and can be used for caries prevention, and tooth sensitivity.

P03-68

Comparative analysis of changes in elemental composition of two Ag-brazing alloys after 1 year intraoral exposure

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Background: Soldering is a useful and needed procedure for the joining of metallic parts and is the most frequently used joining technique in orthodontic and pediatric metallic appliances. Although a number of previous studies have demonstrated that metal ions can be released from these appliances under clinical conditions as a result of corrosion, they are still used in clinical practice.

Aim: The aim of the present study was to evaluate the changes in the elemental composition of two Ag-based brazing alloys used for preparation of space maintainers after *in vivo* aging.

Design: Space maintainers were prepared by the same dental technician using one brand of orthodontic wire and prefabricated bands. Two Ag-based brazing alloys were used for the fabrication of twenty appliances, ten of them were brazed with Universal Silver Solder, (Dentaurum, Germany) and the rest with Orthodontic solder (Leone, Italy). Before intraoral placement the elemental composition of specific areas was analyzed by SEM/EDX analysis employing 25 kV accelerating voltage, 110 µA beam current and a 70 × 70 µm and collecting window. SEM images were taken from

these areas in order to facilitate identification of the initially probed areas after *in vivo* aging. Following intraoral exposure, the devices were retrieved and the elemental composition was reassessed at the same areas by SEM/EDX analysis. The elemental composition before and after *in vivo* aging was statistically analyzed ($\alpha = 0.05$). **Results:** Both brazing alloys demonstrated a significant decrease in Cu and Zn content (Table 1).

Table 1. Mean values and standard deviation of Cu and Zn before and after intraoral aging of the Ag based alloys used.

	Dentaurum		Leone	
	Beforeaging	Afteraging	Beforeaging	Afteraging
Cu	15.1 ± 1.3 ^a	9.4 ± 2.2 ^b	21.9 ± 3.7 ^a	7.4 ± 3.8 ^b
Zn	20.8 ± 1.4 ^a	16.6 ± 2.0 ^b	22.6 ± 3.1 ^a	16.6 ± 1.9 ^b

Superscripts indicate mean values without statistical significant differences ($P > 0.05$)

Conclusion: Both Ag based soldering alloys demonstrated a significant reduction in Cu and Zn content after intraoral exposure that may rise biocompatibility issues for the Ag-brazing alloys tested.

P03-69

Durability of class II amalgam fillings in primary molars

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Introduction: Proximal caries in primary molars can be restored with different dental materials, such as composite resins, glass-ionomer cements and amalgam. Amalgam, by its high strength and durability, is still the material of choice for Class II fillings with large occlusal component.

Aims: Assessment of the durability of classical class II amalgam fillings in primary molars and the frequency and causes of failures.

Methods: The prospective cohort study covering a period of three years was carried out on a sample of 138 patients (mean age of 5 years 5 months) which received a number of 510 class II fillings. For the survival analysis, Kaplan-Meier mean survival time estimates were computed and differences tested with the Log Rank Test. Significance level was set at 0.05 for all tests.

Results: Amalgam was the material most used (53.92%, $n = 275$). Mean survival rate for amalgam fillings was 1514 days (95% CI = 1165–1862 days). The proportion of failures was 22.5%, of which most were due to secondary caries.

Conclusions: Amalgam was the main option for the restoration of proximal caries on primary molars, showing a satisfactory life span. Further studies are needed to estimate the comparative durability of class II amalgam fillings compared to those of adhesive materials.

P03-70

Volatile organic compounds assessment in a dental clinic: bonding agentsI. TZOUTZAS¹, M. ANTONIADOU¹, C. G. HELMIS²,
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Background: In dental clinics, bonding agents which are routinely used in dental procedures can spread into the air and affect the air quality. Few studies have examined the concentrations emitted from such substances in dental clinics.

Aim: The study aims to the assessment of volatile organic compound (VOC) concentrations emitted from bonding agents in dental clinics. Environmental factors such as air movement within the dental setting, and humidity that potentially influence the VOC concentrations were also examined.

Design: Five bonding agents routinely used in dental operations were selected and the total volatile compounds (TVOCs) concentrations were monitored at different distances from the source. Environmental factors (i.e. air movement near the source, relative humidity and ventilation rates) were also examined with the aim of a prototype experimental setup and theoretical methods.

Results: TVOCs concentrations emitted from bonding agents ranged between nearly 30000 and 100 ppb. TVOCs concentrations reduced substantially away from the source dropping to nearly background values. No significant dependence from the environmental factors was observed.

Conclusions: TVOCs concentrations emitted from bonding agents were significantly higher right above the source, than away from the source. The effect of environmental factors usually encounter in dental clinics was small.

P03-71

Restoration of severely decayed primary incisors under general anesthesia: a challenge to the paedodontist

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Background Aim: Early Childhood Caries is an infectious oral disease of young children that can affect the primary teeth of infants and preschool children. Typically the maxillary primary incisors are first involved and pulp involvement and gross destruction of them will lead to decreased masticatory efficiency, difficulty in speech, compromised esthetics and subsequent psychological problems. The restoration of these severely decayed primary incisors is often a procedure that presents a challenge to dentists, particularly in an uncooperative child.

Design: In this lecture we have a review the methods for restoration of severely decayed anterior maxillary teeth in children with Early Childhood Caries from past to now on. Furthermore one of the methods of direct composite resin build up on maxillary anterior incisors which have been applied on children aged 2–5 years in Mashhad Dr Sheikh Children Hospital under general anesthesia is reported.

Conclusion: Dental treatment under general anesthesia is an expensive alternative but on certain occasions the method of choice for restoration of severely decayed primary teeth in uncooperative children. This approach offers the advantage of providing extensive complete oral rehabilitation in a short period of time and in a single visit, allowing immediate relief of pain and long term benefits for the child.

P03-72

Study of type of brand naming of dental clinics in the Korean academy of pediatric dentistryS. YOUN-SOO¹, A. SO-YOUN², K. AH-HYEON³¹*College of Shin-heung, Department of Dental Hygiene, South Korea;* ²*School of Dentistry, Department of Pediatric dentistry, University of Wonkwang, South Korea;* ³*School of dentistry, Department of Preventive Dentistry and Public Oral Health, Research Center for Orofacial Hard Tissue Generation, University of Yonsei, South Korea*

Aim: The purpose of this study were to investigate the institutional patterns and characteristics of brand naming for dental clinics among The Korean Academy of Pediatric Dentistry.

Design: We examined the pattern of brand naming for dental clinics depending on various factors in 551 members of The Korean Academy of Pediatric Dentistry.

Results: (i) Brand naming depending on the sex showed that the clinical subspeciality was shown in 33.4% and the name of people or regional location was shown in 31.7% in male members. In female members, the clinical subspeciality was shown in 49% and a feeling of affinity was shown in 29.9% ($P < 0.05$). (ii) Brand naming using the name of people and regional location in association with the year of graduation, the period before the 1960s was 66.7% the 1960s was 62.5% the 1970s 68.8% and the 1980s was 46.5%. That is, these periods accounted for most part. During the 1990s, however, Brand naming based on the clinical subspeciality accounted for 52.2%. After the 2000s, it accounted for 59.8% ($P < 0.05$). (iii) In Seoul, Pusan and Kyounggi Province, brand naming based on the clinical speciality accounted for the most part. In other areas, the name of people and regional location as well as a feeling of affinity was the most prevalent ($P < 0.05$).

Conclusion: There was a variability in the pattern of brand naming for dental clinics in association with the sex, schools of graduation, year of graduation and the regional location.

Poster Session P04/Endodontics 1

P04-73

Pulp revascularization of immature permanent tooth with apical periodontitis

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Introduction: Revascularization of the pulp in a necrotic, infected immature tooth with apical periodontitis has attempting several years. Revascularization of partially necrotic pulp in an immature tooth is based on the concept that vital dental stem cells can survive pulpal necrosis. Procedures attempting to preserve the potentially remaining dental pulp stem cells, mesenchymal stem cells of the apical papilla, periodontal ligament stem cell can result in canal revascularization and the completion of root formation. Revascularization procedure attempts to obtain longer and thicker roots. And it has shorter procedure time and more economic treatment because of less dental care visits. But it has a lack of long term follow up data and possibility of accelerated canal calcification.

Case report: We reported four cases of revascularization procedures. Patients visited the hospital due to toothache. Radiographic evaluation showed an immature open apex and apical periodontitis on the root. Coronal portion of the canal was irrigated with 5.25% NaOCl but without mechanical instrumentation and the triple-antibiotics paste, composed of metronidazole, ciprofloxacin and minocycline was applied. Every 2 weeks teeth were evaluated, and 1 month to 3 month later, MTA was applied in the coronal portion of the canal.

Comments: Revascularization could be effective for managing immature permanent teeth with apical periodontitis, but it needs appropriate case selection.

P04-74

Histopathologic evaluation of the pulp after direct pulp capping with calcium hydroxide and mineral trioxide aggregate in primary teeth

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Background: Mineral trioxide aggregate (MTA) is a relatively new material. It is biocompatible and has sealing ability.

Aim: The purpose of this study was to evaluate the histologic pulp responses of calcium hydroxide and MTA placed directly on exposed pulp tissues.

Design: Twenty teeth already scheduled for extraction for orthodontic reasons were selected for this experimental study. These teeth were divided into two groups and treated with direct pulp

capping. Calcium hydroxide was used in 10 teeth and MTA in 10 teeth.

After 60 days, the teeth were extracted and prepared for histological evaluation. Finally, the data were analyzed with Mann-Whitney test.

Results: All teeth treated with calcium hydroxide showed inflammation. Internal resorption was seen in six teeth, abscess in five teeth and calcified bridge in six teeth. Inflammation was seen in two mineral trioxide aggregate samples and calcified bridge in seven teeth. Internal resorption and abscess were not seen in mineral trioxide aggregate group.

Conclusion: Mineral trioxide aggregate appeared to be superior to calcium hydroxide as a pulp capping agent in primary teeth.

P04-75

Regenerative endodontics for the management of non-vital immature permanent teeth: a collection of case reports

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Introduction: The management of non-vital immature permanent teeth has always been a challenge. Although not always possible to achieve, apexogenesis is the treatment of choice, leading to continuing root development, normal thickness of the dentinal walls and apical formation. In contrast, apexification is a compromised treatment option providing only a calcific barrier of the wide root canal. Recent research suggests that Regenerative Endodontic Therapy (RET) can be successfully implemented for the treatment of severely infected immature teeth. Stem cells of the apical papilla (SCAP) have been suggested to provide the cell source of root odontoblasts allowing root maturation. The aim of this presentation is to present several cases treated with RET in Leeds Dental Institute for the management of non-vital immature teeth with or without signs of infection.

Case Report: During the first appointment the root canals were accessed and, following minimal instrumentation and thorough irrigation, the canals were dressed with a triple antibiotic paste to promote disinfection. When all clinical signs of infection were eliminated, intra-canal bleeding was induced with a long instrument extending to the periapical region and a blood clot was achieved with gentle pressure with a sterile cotton pellet. The tooth was hermetically sealed and regularly followed-up. Clinical and radiographic evidence of pulp revascularization and continuing root development occurred 4–6 months after completion of the treatment.

Comments: RET promotes a paradigm shift in managing non-vital immature permanent teeth.

P04-76

The comparison of periodontal ligament injection and alveolar nerve block in the pulpotomy of mandibular primary molarR. HAGHGOO¹ & H. SEMYARI²¹*Department of Paediatric Dentistry, Dental School, Shahed University, Tehran, Iran;* ²*Department of Periodontology, Dental School, Shahed University, Tehran, Iran*

Background: Inferior alveolar nerve block is a common technique for anesthetizing primary mandibular molars. A number of disadvantages has been associated with this technique such as the long duration of the anesthesia that might make the child to bite his/her tongue and lip. Periodontal ligament injection could be considered as an alternative method for inferior alveolar nerve block.

Aim: The aim of this study was to determine the effectiveness of periodontal ligament injection compared with mandibular block pulpotomy in mandibular primary molars.

Design: This was a sequential double blind randomized trial. The study population consisted of 80 cooperative children aged 3–7 years-old, requiring pulpotomy on contralateral mandibular molars. Pulpotomy was performed on each patient during the same appointment. Sign of discomfort included body and eye movement indicating pain, verbal complaint, and crying (SEM scale) were evaluated blindly by a dental assistant who was not aware of the two groups. The data were analyzed by *t*-test.

Results: Success rate was 88.75 and 91.25 in periodontal ligament injection and mandibular block technique respectively. No statistically significant difference was found between the two anesthetic techniques.

Conclusions: Results showed that periodontal ligament injection can be used instead of inferior alveolar nerve block in treating mandibular primary molars.

P04-77

Success rates of pulpotomy treatments in primary molars using either sodium hypochlorite or formocresol

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Background: Formocresol has been one of the most popular medicaments for pulpotomy in primary molars for decades. However, the continued searching for its alternatives is growing due to concerns of formocresol's toxicity.

Aim: To compare success rates of pulpotomy treatments in primary molars either using 5.25% sodium hypochlorite or 20% formocresol.

Design: Sixty four primary molars that met the inclusion criteria were randomized into two treatment groups. There were 33 and 31 teeth in the sodium hypochlorite and formocresol group respectively. Final restorations for both groups were made with stainless steel crowns. Clinical and radiographic results were evaluated at 3

and 6 month-periods. Chi-square test was used to compare the success rate between the groups.

Results: At 3 and 6 month-periods, 61 teeth were examined (31 teeth in the sodium hypochlorite group and 30 teeth in the formocresol group). At the 3 month recall, the clinical success rate was 100% in both groups. At the 6 month recall, the radiographic success rate in the sodium hypochlorite group was 90.32% and in the formocresol group was 86.67%. There was no statistically significant difference in the success rate between the sodium hypochlorite and the formocresol groups.

Conclusions: At a relatively short recall period, the overall success rates were similar in the sodium hypochlorite and formocresol groups. From the result of this study, it may be concluded that sodium hypochlorite may be an alternative pulpotomy medication.

P04-78

Pulp treatment approach in Greek children

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Aim: The aim of the present study was to collect information concerning the profile of paediatric dentists and dental practice, as well as their approach of performing pulpotomy and pulpectomies in primary teeth.

Design: A questionnaire was distributed to the attendees of the annual seminar of the Hellenic Academy of Paediatric Dentistry in Athens in 2009. Information was collected on the dentists' personal characteristics, office profile, materials used for pulpotomy and pulpectomy in primary teeth and their treatment proposal to four hypothetical clinical problems.

Results: Seventy-three out of 100 attendees returned the questionnaire. Almost all of the attendees were paediatric dentists from which 40% had completed their postgraduate studies in Greece, 24.2% in U.K. and 22.6% in U.S.A. The number of pulpotomies per month carried out by the respondents was almost triple that of the pulpectomies (mean score: 18.33, SD: 21.43 vs 6.44, 8.11, respectively). The material of choice for half of the paediatric dentists was ferric sulfate while 17% used formocresol and 26.7% both materials. Ninety-two percent reported pulpotomy as the treatment of choice for the first primary molar with extensive caries and no spontaneous pain. Only 8% of the paediatric dentists performed indirect pulp capping for the same case. When the second primary molar had caries and prolonged hemorrhage during pulp excavation, 67.6% would perform pulpectomy and 22.5% tooth extraction.

Conclusion: The majority of the respondent Greek paediatric dentists used ferric sulfate for the pulpotomy. Extractions and indirect pulp capping would be rarely the treatment of choice for carious primary molars.

P04-79

Effects of chlorhexidine on human deciduous dental pulp cells

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Background: Chlorhexidine (CHX) had been used in dental clinic for irrigation in deciduous teeth. However, there is little research about the effects of chlorhexidine on human primary tooth dental pulp cells.

Aim: The purpose of this study is to evaluate the effects of CHX on human primary tooth dental pulp cells.

Design: Dental pulp cells were isolated and cultured from human deciduous teeth. In the experimental groups, dental pulp cells were either irrigated with 0.12% CHX (group 1) or immersed in 0.12% CHX for 15 min (group 2). For evaluation, cell viability was investigated with MTT assay on the 5th, 7th and 10th day after treatment with CHX. In addition, ALP activity and ARS assay for evaluation of the mineralization potential of dental pulp cells were performed on the 5th, 7th and 10th day. Deciduous dental pulp cells without treatment with CHX were used as control.

Results: Our results indicated that, after treating pulp cells with 0.12% CHX for 7 days, about 80% of deciduous dental pulp cells growth was inhibited in the experimental group which was significantly different from the control group. It was also found that the mineralization potential of cells in the experimental group decreased after treating cells with 0.12% CHX for 10 days and percentage was about 50% of that in the control group with significant difference.

Conclusions: This study demonstrated the treatment of pulp cells with 0.12% CHX in decreased the cell growth and mineralization potential of human deciduous dental pulp cells.

P04-80

Ethical and legal aspects of dental stem cell research in Turkey

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Introduction: Missing or structurally compromised teeth due to caries, trauma, congenital anomalies, periodontal diseases are rehabilitated with conservative dental treatment, crown restorations or dental implants. Due to restorative material weakness against time dental regeneration is regarded as the best alternative. The debate revolving around this topic focused on the use of embryonic stem cells for some time. Emphasis on non-embryonic stem cell oriented research relieved this tension. Mostly present studies are at research level; majority of these are *in-vitro* researches

focusing on proving the stem cell properties of different oral originated tissues. Today majority of stem cell research in dentistry are non-embryonic-stem cell based but future may necessitate embryonic stem cell use.

Aim: Our purpose was to summarize the legal rules and regulations in this promising research field in Turkey to draw attention to the importance of stem cell researches and its implications for stem cell research in dentistry.

Conclusion & comments: Although stem cells have always existed, its use for therapeutic purposes are new. The pace difference between the scientific progress and legal regulations is bound to create controversy in this uninhabited field of research. The high hopes burdening this field seems to create both attention and dispute. To make these wishes come true legal regulations are necessary for bringing order to this chaotic state and guide researchers to respect human life.

P04-81

OCP-mediated cement as a root canal filling material for deciduous teeth

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Background: Octacalcium phosphate (OCP) is considered to be a precursor of biological apatite crystals. The results of our previous studies showed that a new CPC setting composed of OCP and α -TCP had physical properties favorable for use in the clinical setting (OCP-mediated cement).

Aim: The aim of this study is to evaluate the OCP-mediated cement as a root canal filling material for deciduous teeth. It has to have superb biocompatibility and has to be simultaneously absorbed along with the deciduous root. In this study, we characterized the phase transformation of the cement *in vivo*, and evaluated the *in vitro* resorption potential of human osteoclast on OCP-mediated cement.

Design: (i) The cement was infused in the subcutaneous tissues of mice right after mixing. After 1 day and 1 week, the hardened cements were removed, and the crystal phases of the cement were identified by XRD and SEM. (ii) Human monocytes purified from human blood were seeded onto disks of OCP-mediated cement. The cells were cultured up to 15 days. Blue fluorescent Hoechst and red fluorescent Phalloidin were used for cell staining.

Results: Crystal structure of OCP-mediated cement had changed into OCP and HA, and activated human osteoclasts were observed on OCP-mediated cement disks.

Conclusions: OCP-mediated cement has a similar structure to deciduous root, and could be absorbable by human osteoclasts. It seems to be a suitable material for root canal filling of deciduous teeth.

P04-82

Comparison of mineral trioxide aggregate and 20% formocresol in pulpotomized human primary molarsC. HSIN-YI¹, L. YUAN-LING^{1,2}, H. GUAY-FEN², C. HSIAO-HUA^{1,2}, W. YIN-LIN^{2,3} & H. CHING-CHUN⁴¹Graduate Institute of Clinical Dentistry, School of Dentistry, National Taiwan University, Taipei, Taiwan; ²School of Dentistry, National Taiwan University, Taipei, Taiwan; ³Department of Dentistry National Taiwan University Hospital, Taipei, Taiwan; ⁴School of Dentistry, University of Michigan, USA**Background:** Mineral Trioxide Aggregate (MTA) reported as a material with excellent sealing ability and biocompatibility has been recommended for pulpotomy of primary teeth.**Aim:** The objective of this study was to prospectively assess the clinical and radiographic outcomes between MTA and dilute 20% Formocresol (DFC) in pulpotomized human primary molars.**Design:** A total of 37 children from 2.5 to 10 year-old received randomly assigned MTA or DFC pulpotomy procedures in 70 primary molars at National Taiwan University Hospital between December 2009 and July 2010. The treated teeth, recalled at 3- and 6-months, were examined clinically and radiographically by blinded evaluators. All data were statistically analyzed using the SPSS program with a statistical significance at $P < 0.05$.**Results:** The recall rates were 90.0% and 85.7% for the 3- and 6-month follow up, respectively. None of the treated teeth showed clinical signs and symptoms of the follow-up periods. At the 3-month recall, the radiographs of the pulpotomized teeth presented normal features (MTA: 54.2%; DFC: 67.9%), root canal calcification (MTA: 37.2%; DFC: 17.9%), or pathological root or/and bone resorption (MTA: 8.6%; DFC: 14.2%). As the follow-up period increased to 6 months, significant less teeth exhibit normal features (MTA: 38.2%; DFC: 46.2%) and more teeth with root or/and bone resorption (MTA: 14.2%; DFC: 23.0%) were found in radiographs in both groups. In addition, the resorption noted radiographically in the DFC group was statistically more pronounced.**Conclusions:** Compare to DFC, MTA may exhibit more favorable radiographic outcomes in primary molar pulpotomy.

P04-83

Electrosurgical pulpotomy with zinc polycarboxylate cement sub-base (a randomized clinical trial)

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Background: Electrosurgical pulpotomy has been proposed as an alternative to formocresol pulpotomy in pulp treatment of primary teeth, but its success rate has been reported lower than formocresol pulpotomy in some literature. It may be in part due to Eugenol from Zinc Oxide Eugenol (ZOE) sub-base.**Aim:** The purpose of this study was to compare the clinical and radiographic success rates of electrosurgical pulpotomy of human

primary molars with zinc oxide eugenol (ZOE) and zinc polycarboxylate (ZPC) cements.

Design: In this randomized clinical trial study, 120 primary second molar teeth were treated by electrosurgical pulpotomy. Teeth were randomly assigned to two groups according to whether ZOE or ZPC cement was used as a sub-base. Teeth were restored with stainless steel crowns and were evaluated clinically and radiographically after 6 and 12 months by two independent examiners. Clinical treatment outcomes and radiographic findings were statistically analyzed using Fishers' exact test with statistically significant differences defined for $P < 0.05$.**Results:** At 12 months, the clinical and radiographic success rates in the ZOE group were 98.2% and 84.2% and in the ZPC group were 96.3% and 75%, respectively ($P > 0.05$ for all).**Conclusions:** The outcomes of this study suggested that either ZPC or ZOE sub-base have similar clinical and radiographic success in electrosurgical pulpotomy.

P04-84

Temperature changes in pulp tissues of primary molar teeth during cavity preparation dentin with ER:YAG laser versus High speed turbine

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Background: Er:YAG laser has been used in pediatric dentistry, for removal of carious tissues as an alternative method to high speed turbines. There have been many studies about heat effects of Er:YAG laser on the pulp tissues of permanent teeth but limited studies have been published for primary teeth.**Aim:** To determine and compare the heat effects of Er:YAG Laser and high speed turbines at pulp tissues of primary teeth.**Design:** Sixty extracted and caries-free primary molar teeth were included in the study. Five groups of 12 teeth were formed: four with different powers of Er:YAG laser used: 5, 3.75, 2.25, 1.5 W and one group with high speed turbine. Class V cavity preparations were performed in each tooth with 1 and 1.5 mm of dentin depths. The internal pulp temperature as recorded with a thermocouple that was introduced into the pulp chamber and attached to calibrated digital thermometer. Temperature changes were calculated as the difference between the maximum and initial temperature.**Results:** There were significant differences between all Er:YAG laser groups and high speed turbine group except for 1 mm dentin depth between groups of 3.75 W/high speed turbine and 2.25 W/1.5 W. Also 5W Er:YAG laser group had significantly higher temperature values than all groups.**Conclusions:** The temperature increases remained below the determined critical pulpal heat value of 5.5°C for both caries preparation methods. Further studies are needed to determine the heat effects of Er:YAG lasers on primary teeth.

P04-85

Physiological and pathological external root resorption in human teeth: scanning electron microscopy examination of the resorbing front and comparison of macroscopic and radiographic appearance

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Aim: To compare the physiological and pathological external root resorption through Scanning Electron Microscopy examination of the resorbing front of root dentin and the macroscopic and radiographic appearance of pathological external root resorption.

Design: Twenty-four primary teeth at various stages of physiological root resorption (group A), 20 permanent teeth with macroscopically visible external root resorption (group B) and 10 permanent premolars with incomplete root formation (group C) were included in this study. Radiographs of all teeth in group B were obtained prior to extraction. Specimens were examined under Scanning Electron Microscope equipped with Energy-Dispersive x-ray Spectrometer.

Results: Extensive morphological similarities were found between specimens in group A and B regarding the resorbing front. In both groups resorption of intertubular dentin seemed to progress faster than that of peritubular dentin. Peritubular dentin was absent in isolated dentinal tubules but also in groups of tubules occupying a few resorbing areas. Calcium granules were found on the resorbing dentin front at all sites with prominent peritubular dentin. No signs of resorption were found in group C. The mineralization front appeared as a negative image of the resorption front in groups A and B. Macroscopically visible external root resorption in teeth of group B was not always radiographically evident.

Conclusions: The resorbing front of root dentin was similar for physiological and pathological root resorption. Pathological apical root resorption may not be manifested in single periapical radiographs, except when it is advanced.

P04-86

TGF-β1 regulates osteodifferentiation of periodontal ligament cells by controlling IGF-1 expression and function

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Background: We established the experimental models to study the negative effect of TGF-β1 on osteodifferentiation. We found that human periodontal ligament cells (HPDL) have an ability to differentiate into osteoblasts while that consecutive administration of TGF-β1 to HPDL cells inhibit osteodifferentiation.

Aim: We found several key molecules which regulate TGF-β1 induced positive and negative osteodifferentiations. Here we show especially the mechanisms of this negative effect of TGF-β1 on osteodifferentiation.

Design: HPDL cells were treated with single 1, 100 ng/mL or multiple 1 ng/mL TGF-β1 for 3 days. Alkaline phosphatase (ALP) activity was detected by ALP activity staining. Osteogenic related gene was detected by microarray and transcription of osteodifferentiation markers determined by Real-time PCR. We also investigated that dexamethasone could modulate HPDL osteodifferentiations.

Results: Treatment with 1 ng/mL TGF-β1 causes osteogenesis while 100 ng/mL TGF-β1 induced much less expression of osteodifferentiation marker proteins. However, multiple treatment with 1 ng/mL TGF-β1 significantly down regulated osteodifferentiation of HPDL. The microarray analysis revealed that IGF-1 and PAPP expression were remarkably reduced about 1/10 respectively. We also found that the expression of IGF-1 increased about hundreds to thousands folds in the vicinity of induction of bone differentiation. These effect also negatively or positively regulated by dexamethasone.

Conclusions: GF-β1 could regulate IGF-1 expressions in HPDL. The expression of IGF-1 and autocrine of it might be the key factor for bone differentiation.

P04-87

Propolis, chlorhexidine & calcium hydroxide- what irritates more?

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Background: During endodontic procedures in children, a paedodontist focuses mainly on antimicrobial property of an irrigant. This often neglects inherent ability of the same to induce inflammation which is an issue of much greater concern for managing periradicular infections.

Aim: To comparatively evaluate antimicrobial & inflammatory potential of 4% Dimethyl Sulfoxide (DMSO) extract of Propolis with conventional endodontic irrigants: 2% Chlorhexidine & 4% Calcium hydroxide.

Design: An *in vivo* randomized control trial was designed to evaluate antimicrobial potential of test irrigants. Serial microbial samples from deciduous molars were subjected to anaerobic & aerobic bacterial colony forming unit count before & after irrigation with test irrigants in sixty children. An *in vivo* randomized control trial was carried out to evaluate inflammatory potential. Thirty wistar rats were subjected to physicochemical method for quantification of enhanced vascular permeability of Evans Blue Dye. This was done by evaluating optical density (OD) of inflammatory exudate.

Results: Microbiological cultures demonstrated inferior antimicrobial activity of calcium hydroxide compared to chlorhexidine & DMSO propolis. Spectrophotometric analysis at 620 nm at 90 min revealed mean OD of calcium hydroxide to be maximum (0.206 ± 0.085) while that of normal saline (control) to be minimum (0.032). However, at 180 min, mean OD of propolis was found to be minimum (0.075 ± 0.015).

Conclusion: The irrigant of choice should be based not only on efficient antimicrobial potential, but also on its inflammatory potential. Holistic agents like propolis may act as appropriate replacements for conventional endodontic irrigants.

P04-88

MTA applications in paediatric dentistry: report of three cases

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Introduction: Aim of this presentation was to highlight the use of Mineral Trioxide Aggregate (MTA) in Pediatric Endodontics through selected case reports. MTA is a material extensively used in Endodontics. MTA induces hard tissue formation on its surface. Results from *in vitro* and *in vivo* research show that MTA can be predictably used in many endodontic procedures. In pediatric endodontics MTA has been used as a pulp capping, pulpotomy material, and as apical barrier in the treatment of teeth with immature root formation.

Case report: A 10 year-old boy presented at the emergency room of the postgraduate Pedodontics department with a complicated crown fracture with pulp exposure on the permanent central incisor. MTA was placed at the exposure site and the tooth was restored immediately with composite.

A 9-year-old boy presented at the dental office with a deep carious lesion at an upper first molar. Excavation of the carious lesion led to major exposure of the pulp chamber. Pulpotomy with MTA was preferred over root canal treatment.

A 12-year-old boy presented at the dental office with discoloration and incomplete root formation on the permanent central incisor and history of trauma. MTA was placed as apical barrier. The rest of the root canal was filled with injection of thermo plasticized gutta-percha.

Comments: MTA seems to be the material of choice in many procedures in pediatric endodontics. Its high cost and handling difficulties shouldn't be overlooked but its overall performance and promising research results overcome its drawbacks.

P04-89

Pulpotomy of primary molars using standard and modified calcium hydroxide techniquesO. THAIS¹, L. N. NATALINO¹, S. VIVIEN², A. B. MORETTI², M. A. MACHADO¹ & R. ABDO¹¹Bauru School of Dentistry, University of São Paulo, São Paulo, Brazil; ²Federal University of Alfenas, Brazil

Background: Pulpotomy of primary teeth has been the treatment of choice in cases of inflammation of the coronal pulp caused by caries or trauma, thus avoiding the premature loss of the teeth.

Aim: The aim of this study was to compare the effectiveness of calcium hydroxide (CH) and calcium hydroxide following a

corticosteroid/antibiotic solution (O + CH) as pulp dressing agents in primary teeth.

Design: Thirty mandibular primary molars were carefully selected. The teeth were assigned in groups and treated by conventional pulpotomy technique. Clinical and radiographic follow-up was made at 3, 6, 12, 18 and 24-months. Teeth were left to regular exfoliate period and further processed for microscopic analysis.

Results: The groups presented radiographic failure, characterized as internal resorption, being eight cases in CH group and seven in O + CH group after 24 months of follow-up. Besides, six cases presented a dentin barrier in the CH group and five in the O + CH group at 24-month follow-up. Microscopic analysis revealed the presence of some necrotic areas in root canals presenting internal resorption and the presence of reactive dentin barrier in the CH group. The group O + CH revealed less inflammatory infiltrate in both situations and the presence of reactive dentin barrier.

Conclusions: The use of CH as compared with O + CH suggests enhanced clinical success rate when used prior to the placement of calcium hydroxide as a pulp dressing material for pulpotomies of primary teeth. Although our results are encouraging, further studies and longer follow-up assessments are needed in order to determine the safe clinical indication of O + CH.

P04-90

Endodontic treatment with mineral trioxide aggregate as an apical plug: a case report.

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Introduction: Immature teeth present major difficulties when endodontic treatment is required. The conventional treatment approach is apexification using calcium hydroxide. This procedure however, is associated with some drawbacks such as the long time required for optimal results, the incomplete formation of the dentine bridge and the possibility of root fracture during the treatment period. A modern alternative treatment is the use of mineral trioxide aggregate (MTA) as an apical plug. The main advantages of this technique are the time in which the treatment can be completed, the biocompatibility of the material and the ability of promoting periradicular tissue regeneration.

Case report: In the present clinical report, we describe the endodontic management of a maxillary central incisor with open apex and a large periapical lesion using the MTA apical plug technique after the unsuccessful apexification with calcium hydroxide.

Poster Session P05/Syndromes and Genetics 1

P05-91

Maxillofacial rehabilitation of pediatric patients with head and neck cancer

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Introduction: The quality of treatment and rehabilitation for the head and neck cancer patient, especially the pediatric patient, has progressed markedly over the years due to the cooperation of specialists in the total care of the patient. The management of head and neck cancer presents functional and esthetic problems related to the loss of important structures. Maxillofacial prosthetics provides rehabilitation of intraoral and extraoral defects created by disease, injury, surgery, or congenital malformation.

Case reports: Clinical cases of head and neck cancer in pediatric patients will be presented. Treatment was provided by multiple services in a multidisciplinary fashion. The patients were initially diagnosed by the head and neck surgeon, and referred to the different medical and dental services for treatment plan formulation. Patients were referred to the maxillofacial prosthodontist as early as possible to evaluate the facial and oral status. The prosthetic rehabilitation included, management of acquired intraoral and extraoral (facial) defects and long-term follow up care during the critical growth period.

Comments: Effective management of pediatric patients with head and neck cancer consists of a multidisciplinary approach involving among others, head and neck surgeons, medical oncologists, neurosurgeons, plastic surgeons, pediatric dentists and maxillofacial prosthodontists. The maxillofacial prosthodontist is an integral member of the therapeutic team, since survivorship and rehabilitation are closely interacting concepts when applied to the cancer experience. Treatment is not only focused on the control or eradication of the disease itself, but also on restoration of the cancer patients' quality of life and functional status.

P05-92

Bone healing in an animal model of hyperglycemia

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Background: Hyperglycemia is the major systemic change in both adult and childhood diabetes and its effects on bone healing are not fully understood.

Aim: This study aims at investigating the temporal effects of hyperglycemia on bone healing in rats.

Methods and materials: Animals ($n = 80$) were divided into two groups: hyperglycemic (HG) and non-hyperglycemic control (NH). Hyperglycemia was induced by the intraperitoneal injection of Streptozotocin (65 mg/kg). Rats with blood glucose of > 16 mM were considered hyperglycemic. One week post induction, osteo-

my defects were created in both femora of each rat using a 2.3 mm diameter dental burr. Defects were left to heal for 5, 10, 15, and 30 days. Hyperglycemia was successfully achieved and the post-operative period was uneventful. Tetracycline and alizarin red were administered alternatively at weekly intervals in animals of the latter group. Femora were collected for evaluation of differences in bone healing at the defect site.

Results: Quantitative assessment using μ CT indicated a delay in intramedullary bone formation occurring up to 10 days in HG animals as demonstrated by decreased bone volume %, trabecular number and connectivity density of bone compared to that of NH group. Histological assessment confirmed these findings. Data from fluorescently stained samples indicated possible defects in bone mineralization in HG samples, illustrated by decreased abundance and intensity of fluorescence.

Conclusion: Based on these findings, we concluded that hyperglycemia affects the early stages of bone healing and hypothesized that this deleterious effect is concurrent with the osteoconduction phase. Osteoconduction studies are currently being conducted to verify our hypothesis.

P05-93

Dental management of a child with Hermansky-Pudlak syndrome

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Introduction: Hermansky-Pudlak Syndrome (HPS) is a rare autosomal recessive inherited disorder characterized by the following triad; oculocutaneous albinism, bleeding tendency due to platelet storage pool defect and ceroid storage in the lysosomes. This disorder is rare with exception in the Puerto Rican population where it affect 1/1800 person, and it's also more frequent in an isolated Swiss Alps village.

Case report: An 8-years-old girl with Hermansky-Pudlak syndrome, congenital neutropenia, benign congenital hypotonia and mild mitral valve regurgitation presented in the paediatric dental clinic at Sultan Qaboos University hospital following a referral from her paediatric haematologist. On examination, she had poor oral hygiene and dental caries affecting the 52, 62,16,26,36 and 46. All of the first permanent molars had hypomineralisation with the 26 and 36 being most severely affected. Her dental care involved preventative advice and comprehensive dental care under general anaesthesia. The dental treatment was done under antibiotic cover and included restoration of the 16, 46 and extraction of the 52, 62, 26 and 36. The extraction sockets were packed with oxidised regenerated cellulose and multiple resorbable sutures were placed. The haematological management included administration of systemic tranexamic acid for 7 days and transfusion of three units of platelets prior to the procedure and three more units to be available standby in the theatre.

Comments: Two years after the dental treatment the patient's oral health is stable with no evidence of dental disease and all the restorations are intact.

P05-94

The relation of salivary Alkaline Phosphatase and gingivitis in Down syndrome childrenN. MOECHTAR¹, H. SOENAWAN¹, H. SOETADI¹ & N. SOEDARSONO²¹Department of Paediatric Dentistry, University of Indonesia, Indonesia; ²Department of Oral Biology, University of Indonesia, Indonesia

Background: Gingivitis is a major problem for Down Syndrome children.^{1,2} The aberrated chromosome 21st which is the cause of Down Syndrome, is believed causing genes over-expression. This over-expression leads to over production of several enzyme, including Alkaline Phosphatase which often used for damaged periodontal tissue biomarker including gingivitis.^{3,4}

Aim: The purpose of this study is to measure the relation between salivary Alkaline Phosphatase enzyme and gingivitis in Down Syndrome group and healthy control group.

Design: We assessed Gingival Index (GI) and Alkaline Phosphatase (ALP) concentration in ng/ml of saliva using ELISA in 40 subjects (20 Down Syndrome and 20 healthy control aged 13–19 years of age).

Result: Measurement of GI showed insignificant difference between Down Syndrome group and healthy control ($t = 0.156$, $P \geq 0.05$), ALP concentration is significantly higher in Down Syndrome group compare to healthy control group ($t = 3.377$, $P \leq 0.05$). Insignificant very weak relationship was found between GI and ALP ($r = 0.100$, $P \geq 0.05$).

Conclusion: Salivary ALP concentration in Down Syndrome group is significantly higher compare to healthy control group. The relation between GI and ALP is statistically insignificant.

P05-95

Oral findings and dental management of a patient with Progressive Familial Intrahepatic Cholestasis (PFIC)A. TAGELSIR-AHMED¹, L. MARKS² & L. MARTENS²¹Department of Paediatric Dentistry, PaeCaMed Research, Ghent University, Gent, Belgium; ²Centre of Special Care Dentistry, Ghent University Hospital, Ghent, Belgium

Introduction: progressive familial intrahepatic cholestasis (PFIC) refers to heterogeneous group of rare autosomal recessive disorders.

Case report: A 10 years-old male patient of north-African origin, diagnosed with PFIC, was referred by his paediatrician to the former Department of Paediatric Dentistry AND Special Care, Ghent University. The cause of referral was poor oral hygiene, defected teeth and dental pain. Medical history revealed neonatal presentation of liver dysfunction and chronic cholestasis. Biochemical blood examination showed mild anaemia, thrombocytopenia, and stable cholestasis. Extra-oral features: Apart from the obvious signs of jaundice, no major orofacial features were observed. At initial intraoral examination multiple defected teeth, dental caries, and poor oral hygiene were manifested. Additionally obvious green discoloration and hypoplasia of the primary molars, canines and 1st permanent molars were evident. Moreover, all permanent incisors exhibited mild yellow/green discoloration, in addition to the hypoplasia which was pronounced in the incisal one-third of the crowns of 11, 21. Dental management was carried out in different phases starting from improvement and monitoring of oral hygiene to application of pit and fissure sealants and restorative treatment. Pulp therapy was avoided. Atraumatic extractions with use of local haemostatic agents were performed. Composite veneers of hypoplastic incisors were also offered. During the recall appointments, remarkable improvement of the oral hygiene was observed. No new carious lesions were observed. All restorations were intact. Eruption of premolars proceeded normally.

P05-96

Primary cleft lip reconstruction – stability of the therapy after 4 years from the therapyM. KASPAROVA¹, T. DOSTALOVA¹, J. BORSKY² & K. BLAHA³¹2nd Medical Faculty, Department of Paediatric Stomatology, Charles University, Prague, Czech Republic; ²3rd Medical Faculty, Department of Plastic Surgery, Charles University, Prague, Czech Republic; ³2nd Medical Faculty, Department of Biochemistry, Charles University, Czech Republic

Introduction: Many clinical and experimental researches try to find the benefit of fetal healing for human medicine and the possibilities of controlling it. Many studies have shown that fetal and adult wounds heal via different mechanisms. Fetal healing is characterized by rapid re-epithelialization and restoration of normal architecture. In contrast, adult and late-gestational skin heals less rapidly and with the formation of a scar. This benefit is used in early cleft lip reconstruction, where the operation is performed in the first few days after the birth when residual fetal healing is still present. Authors would like to share their experience with early primary suture of cleft lip and the results after 4 years of treatment.

Case report: Male patient underwent cleft lip repair in the age of 3 days. Stability, esthetics and function after 4 years of treatment are presented. Patient has no visible scar on the upper lip, is esthetically and functionally rehabilitated and growth of maxilla and teeth is not retarded.

Comments: Cleft lip-palate centers worldwide differ in opinion to early cleft lip repair. Some of them prefer the classic method when cleft lip repair is performed at the age of 3 months. Our experience with early cleft lip reconstruction is very positive. More than 120 patients underwent this kind of operation and the results are more than satisfactory as shown in this case report.

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P05-97

Feeding obturator for an 18 months-old infant with trisomy 13D. MUSTAFA¹ & P. ASHLEY²¹Shaikh Khalifa Medical City, Abu Dhabi, UAE, ²Eastman Dental Institute, UCL, UK

Introduction: Oral malformations due to trisomies are rarely described especially when accompanied with large cleft defects that interfere with feeding. Management is a challenge for both the parent and the dentist. Maxillary obturators resolve feeding problems and induce better maxillary growth patterns before corrective surgery.

Case report: This case report describes a clinical and laboratory technique for the fabrication of a feeding obturator for an 18 months-old infant with trisomy 13, with a large cleft lip and palate with inability to maintain airway. A modified technique of traditional obturator fabrication is presented, using two different consistencies of vinyl polysiloxane, with emphasis placed on the direct fabrication of a preliminary custom tray, preventing thermal trauma to the tissues, and overcoming the danger of airway obstruction or foreign body aspiration.

Comments: The putty-type vinyl poly-siloxane is the material of choice because of its high viscosity reducing the danger of aspiration or swallowing, and its relatively good detail duplication is satisfactory for the purpose of fabrication of a palatal prosthesis.

P05-98

Oral findings in patients with Silver-Russel syndrome

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Background: Silver-Russel syndrome (SRS) is a clinically and genetically heterogenous disorder characterized by pre- and post-natal growth retardation, and typical dysmorphic features, including malocclusion and teeth abnormalities. The mode of inheritance is variable: (epi)genetic mutations in 11p15 account for 35–65% of SRS cases, and maternal uniparental disomy of chromosome 7 for further 10%.

Aim: Evaluation of oral health and phenotypic features present in children with Silver-Russel syndrome.

Design: Seventeen children with SRS aged 3.3–16 years had clinical assessment of occlusion, dental and oral hygiene status (PL I). Dental caries (dmf/dmfs, DMF/DMFs caries index), teeth abnormalities, gingival condition (GI) were evaluated in all children. An OPG X-ray was taken in children aged 5 and older.

Results: The dmf/dmfs index ranged from 0/0 to 12/44 and DMF/DMFs from 0/0 to 22/50. In nine children dental enamel hypoplasia and/or enamel opacity was noticed. Gingivitis was found in 11 patients. High arched palate was present in 15 children, and crowding in 13 children. Microglossia was diagnosed in two patients and one patient had cleft palate. In two patients hypodontia of permanent teeth was diagnosed. The most commonly observed malocclusion was distal occlusion, deep bite and cross bite.

Conclusion: Children with SRS require multidisciplinary dental management. Oral health care should especially include orthodontic treatment of malocclusion and effective prophylaxis and treatment of dental caries and gingival diseases.

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P05-99

Intermediate rehabilitation of a patient with ectodermal dysplasia

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Introduction: Hypohidrotic ectodermal dysplasia is a disorder affecting the development of the most external layers of the embryo, characterised by the alteration of some ectodermal structures. It frequently affects males with an x-linked recessive

inheritance and less commonly, can have an autosomal dominant or autosomal recessive pattern. The ectoderm contributes to the formation of different parts of the body. When certain areas fail to develop normally, primary defect occur in hair, teeth, nails or sweat gland function.

Case report: The aim of this work is to present an interdisciplinary and comprehensive approach for the treatment of a patient requiring dental care in the Department of Pediatric Dentistry at the School of Dentistry, University of Buenos Aires. A 7 year-old male patient, accompanied by his mother visited our department showing clinical signs compatible with ectodermal dysplasia. As there was no accurate diagnosis, it was suggested medical consultation to evaluate child and his family, confirm diagnose and genetic condition, and determine issues on medical management. The boy presented mixed dentition with multiple dental agenesis, conical teeth and loss of vertical dimension. A maxillary removable partial overdenture and a mandibular fixed space maintainer were fabricated for prosthodontic rehabilitation. Bonded resin composite restorations were placed to improve aesthetics of anterior primary incisors.

Comments: Early diagnosis and treatment of these patients is essential in order to guarantee appropriate chewing function and language development, as well as a better social adaptation improving quality of life.

P05-100

Prevalence and impact of oral pain in 8-year-old children in Saudi Arabia

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Aim: To determine the prevalence, severity and impact of oral pain in 8-year-old children and their parents in Jeddah, Saudi Arabia.

Design: A cross-sectional survey was carried out in a sample of 300 children randomly selected from primary military schools in Jeddah, Saudi Arabia. After formal authorization was obtained from their parents, the children were interviewed and clinically examined by a single examiner.

Results: Of the 300 children selected for the study, 21 children were absent on the days data were collected; therefore the present analysis is limited to 279 children. The prevalence of oral pain was reported in 83% of the children included in the study. Among those children reporting oral pain, presence of decayed tooth was cited as the most common cause of oral pain (86%). Association was seen between oral pain experience and impact on daily activities and showed that: oral pain prevented 30% of the children from eating, 5% from playing, 33% from sleeping and 29% from going to school. In addition, 19% of guardians had to leave their work to take children to the dentist. Only 32% reported seeing a dentist for this oral problem.

Conclusions: The prevalence of oral pain was high among these children. This clearly affected the quality of the children's lives and had a considerable impact on both the children and their parents.

P05-101

Myhre syndrome: first report of characteristic findings in craniofacial disordersN. ISHIBASHI¹, Y. ASAKURA², T. KUBODERA¹ & Y. SASAKI¹¹Department of Pediatric Dentistry, Kanagawa Children's Medical Center, Kanagawa, Japan; ²Department of Endocrinology, Kanagawa Children's Medical Center, Kanagawa, Japan

Introduction: Myhre syndrome is a rare disorder characterized by abnormal growth of the skeleton, muscles and joints. Genetic cause and the effect of this syndrome on craniofacial growth and development have been unclear. We report the characteristic findings in craniofacial disorders in a case of this syndrome.

Case report: A Japanese female had a low birth weight (42 weeks of gestation; BW, 2416 g; BH, 47 cm), and joint contractures were noted at birth. She was referred to the Department of Pediatric Dentistry in our hospital at age 10 years. The other general symptoms of skeleton, muscles, and joints were noticed during her growth and development, i.e., submucous cleft palate, muscle hypertrophy, significantly short stature, short fingers, and thickened calvarium on X-ray. Chromosomal defects were not seen in the test. Based on these clinical findings and other general symptoms, she was diagnosed with Myhre syndrome at age 18 years. Oral examination showed an open bite, crowding in the dental arch, congenital absence of maxillary lateral incisors and crown deformity of the lower central incisors. Maxillary dental arch width and length were smaller than the mandibular ones. The cephalometric analysis showed that the maxilla was shorter than the mandible and positioned behind it, and the mandible was over rotated in a clockwise direction. Temporomandibular-joint movement was restricted by the muscle hypertrophy.

Comment: Skeletal, muscle and joint disorders in our case were commonly diagnosed in systemic and craniofacial region, indicating that the craniofacial growth and development might be affected by general symptoms in Myhre syndrome.

P05-102

Delayed eruption in a patient with monostotic fibrous dysplasia

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Introduction: Fibrous dysplasia is a developmental tumor-like condition that is characterized as replacement of normal bone by an excessive proliferation of cellular fibrous connective tissue intermixed with irregular bony trabeculae. The monostotic form is comprising 70% of the cases. Craniofacial lesions may cause facial pain, facial deformity, tooth displacement, visual impairment and auditory impairment.

Case report: A 10-year-old boy came to the department of Pediatric Dentistry, Yonsei university dental hospital with the chief com-

plaint of delayed eruption of the right mandibular canine and premolars. The radiographic features included a diffuse 'ground-glass' appearance, expansion of the lingual and buccal plates, and delayed eruption of permanent teeth in the right mandibular body area. Except for active new bone formation, no neoplastic changes were seen in the histologic findings. For not have any other bone lesions, we diagnosed the lesion as monostotic fibrous dysplasia on the right mandibular body area.

During 15-month follow-up period, the left mandibular lateral dentition group reached full eruption state, but the right lateral dentition group was erupting slowly in the alveolar bone. Periodic check-up was planned to observe clinical symptoms.

Comments: The 10-year-old patient with monostotic fibrous dysplasia showed bone expansion, radiographic opacification, and delayed eruption on right mandibular body area. During 15-month follow-up period, teeth eruption and maturation was in progress. If tooth eruption stops in the involved area, surgical opening or forced eruption of the impacted teeth will be considered.

P05-103

Dental management of a child with alternating hemiplegia of childhood. A case reportA. BOUGA¹, G. VADIAKAS² & S. GEORGIOU-GOVA¹¹Private Practice; ²Department of Paediatric Dentistry, Dental School, University of Athens, Greece

Introduction: Alternating hemiplegia of childhood (AHC) is a rare, chronic neurological disorder with onset before 18 months. It has a reported incidence of 1:1 000 000 children but this may be an underestimate due to misdiagnose and variability in the clinical presentation. AHC is characterized by repeated attacks of hemiplegia that alternate laterality, oculomotor and autonomic abnormalities, movement disorders, and cognitive impairments. Little is known about the etiology or the pathophysiology of the syndrome as well as of proven effective therapeutic options. Evidence suggests that AHC is a channelopathy, sometimes with mitochondrial abnormalities.

Case report: A 2 year-old boy with AHC presented to our clinic with pain during eating. Patient was still on the bottle at night. Clinical examination revealed a severe type of early childhood carries. Taking into account his age, his dental and general health condition and the reported triggers in AHC we decided to provide dental treatment under general anaesthesia. His case was discussed with the anaesthesiologist and because of the possible link between AHC and malignant hyperthermia (MH), the anaesthetic machine was prepared according to standard MH protocol to avoid the potential risk of rhabdomyolysis. Anaesthesia was induced with norcuron and fentanyl followed by propofol. His temperature as well as other vital signs (Tv, RR, SpO₂, SpCO₂, AP, pulses) was recorded regularly during and after the 2.5 h procedure. Neostigmine and atropine was used at the end to revert myochalasis.

Comments: This is the first case report in the literature for treating a young child with AHC under general anaesthesia.

P05-104

Management of cleidocranial dysostosis with complex odontoma

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Introduction: Cleidocranial dysostosis (CCD) is an autosomal dominant condition characterized by generalized dysplasia of the bones and teeth. The dental manifestations are mainly delayed exfoliation of the primary teeth and delayed eruption of the permanent teeth, with multiple impacted supernumeraries. According to Howard's list, based on their morphology, odontomas are subtypes of supernumerary teeth. In this report, we describe a patient with CCD and her management over 10 years follow-up.

Case report: A 12-year-old girl referred to our department with complaint of unerupted teeth. She was diagnosed as a case of CCD and impacted supernumerary teeth were diagnosed clinically and radiographically. Presence of irregular masses of calcified tissue resembling teeth-like was observed in posterior maxilla. Treatment consisted of surgical removal of impacted supernumerary teeth and odontoma, followed by orthodontic rehabilitation and multiple calcified tissue diagnosed as "complex odontoma" after histopathologic examination.

Comments: Although the etiology of supernumerary teeth is not completely understood, various theories exist. Considering the fact that supernumerary teeth and odontomas are described from the same origin, we think that in CCD, odontomas –just like the supernumerary teeth– may also be accepted as clinical findings specific to the syndrome. While CCD genetics is defined in relation to the genes that cause supernumerary teeth, still much research is needed to be able to define it as specific to this syndrome.

P05-105

Dental phenotype in cleidocranial dysplasia associated with a new mutation of the *RUNX2* gene

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Introduction: The *RUNX2* gene is a physiologic regulatory gene, implicated in osteoblastic differentiation and, by following mutations, in the development of CCD.

Case report: A 13 month-old child presented with clinical and diagnostic features of Cleido-Cranial Dysplasia (CCD) at age 13 months. At age 3 years the diagnosis was corroborated by

genetic analysis revealing a mutation in the *RUNX2* gene, (c.391C<T). During the dental follow-up, at age 8 years the child has revealed a unique dental phenotype consisting of lack of supernumerary teeth and absence of one tooth. This condition has allowed an easy treatment of the child as compared to the usually complex treatment in other CCD patients.

Comments: The association c.391C<T mutation in the *RUNX2* gene and the lack of supernumerary teeth could imply a phenotype-genotype correlation.

It is hoped that this observation might be important to improve knowledge on the pathogenetic mechanisms and manifesting spectrum of dental anomalies in CCD.

P05-106

Prader-Willi syndrome: case series of 8 paediatric patients

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Introduction: Prader-Willi syndrome (PWS) is a complex neuro-developmental disorder induced by loss of function of paternal genes in the long arm of chromosome 15 at q11–q13 and the most common genetic cause of obesity resulting from hyperphagia. Pre- and postnatal hypotonia, short stature, hypogonadism, acromicria, psychomotor retardation and frequent behavioral problems complete the phenotype.

Case report: Eight PWS individuals (6–19 years old) were examined at the Postgraduate Periodontal Clinic of the University of Athens. Medical history was obtained with emphasis placed upon the age of diagnosis, body mass index (BMI) and level of cognitive functioning. Clinical, radiographic and periodontal assessment was performed. Caries experience, salivary flow rate and the pH of the saliva were evaluated. Two patients exhibited localized moderate periodontitis. Plaque and gingival indices ranged between 12% and 100% and between 7% and 75%, respectively. dmft/DMFT scores ranged from 0 to 14. Three patients presented decreased salivary flow rate and one was applying synthetic saliva for saliva replacement. Saliva buffer capacity was determined as medium or high. Occlusal abnormalities including class III malocclusion, overjet, deep bite, crossbites, crowding and dental midline deviation were observed. Three boys demonstrated bruxism and wear facets not commensurate with their age.

Comments: Periodontitis, which was detected in two of the patients, has been previously reported in a case of a child with PWS demonstrating extensive periodontal disease. The syndrome was diagnosed early in all patients, who were regularly monitored by a paediatric dentist. This may have contributed to the more favorable clinical image observed in some patients. However, occlusal abnormalities were prevalent in all cases.

P05-107

Noonan Syndrome: a report of two paediatric cases

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Introduction: Noonan syndrome (NS) is a developmental disorder predominantly characterized by short stature, typical morphological features and congenital heart disease, most commonly pulmonary stenosis and hypertrophic cardiomyopathy. NS is caused in some cases by PTPN11 gene mutations on the chromosome 12 or mutations usually in the KRAS gene.

Case series: Two NS individuals, 11½ and 16 years-old, were examined at the Postgraduate Periodontal Clinic of the University of Athens. Medical history was obtained with emphasis placed upon congenital heart defects, DNA sequence analysis for possible mutations confirming the clinical diagnosis of the syndrome and the probable increased bleeding diathesis due to coagulation disorders. Clinical, radiographic and periodontal evaluation was performed. Caries experience and occlusal abnormalities were assessed. The oral examination revealed high arched palates. Neither of the two patients exhibited periodontitis. Plaque and gingival indices were 12% and 17% and 10% and 9%, respectively. dmft/DMFT scores were 5 and 6. Although a prolonged retention of deciduous teeth was found, congenitally missing teeth were not observed. Occlusal abnormalities included crowding, malalignment of teeth in the lower dental arch and bilateral posterior crossbite.

Comments: The clinical results were similar to previous reports except for the periodontal status (one case series study), the congenitally missing teeth and the presence of multiple caries. The syndrome was diagnosed early in both patients, who were regularly monitored by a paediatric dentist. This may have contributed to the more favorable clinical image observed. Nevertheless, occlusal abnormalities were prevalent.

P05-108

Dentin dysplasia type I: case report

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Introduction: Dentin dysplasia type I is a rare hereditary dental anomaly, it affects the formation of dentin characterized by structural defect with clinical normal appearance of the permanent teeth but no or only rudimentary root formation. It occurs as two forms with clinical, radiographic and histological features with different treatment as well as prognosis. Early loss of all teeth and concomitant underdevelopment of the jaws are challenging for successful treatment with dental implants.

Aim: To recognise and discuss the clinical manifestations of three cases of autosomal recessive rare genetics syndromes: Dentin dysplasia type I.

Case report: Three cases of family dentin dysplasia type 1 and 2, brothers from a consanguineous marriage's cousin and their outcome will be presented. They have been products of a consanguineous marriage having a very severe form of DD type 1, resulting in tooth loss at an early age. We must excluded a mild form of dentinogenesis imperfect.

Conclusions: Normally the dentin dysplasia type 1 is transmitted as an autosomal dominant characteristic but the presence of this anomaly is in front of a parent mentions that this disease is by autosomal recessive, in contrast to literature data.

Poster Session P06/Morita Prize 1- Clinical Research - Dental Materials 2, Growth and Development 1, Others

P06-109

Coefficient of thermal expansion of different types of glass-ionomer cements

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Background: Thermally induced loads introduced to restored teeth with glass-ionomer cements (GIC), influence the values of the coefficient of thermal expansion (CTE) of both dental hard tissues and restorations, directly relating to degree of microleakage and mechanical degradation due to their differences. GICs are supposed to have CTE closer to those of tooth substances, compared to resin composites, inducing lighter volumetric changes. Resin modified GIC counterbalance thermal expansion and polymerization shrinkage.

Aim: The purpose of this study was to compare CTE values of three types of GIC with a resin as a control.

Design: A typical GIC, a GIC with altered acid composition, a resin-modified GIC and a hybrid resin were used. Four specimen 4 mm thick were made from each material. Dilatometer Netzsch-Dil 402c was used at 20–60°C.

Results: KetacMolar exhibits lighter thermally induced volumetric changes when compared to N100 ($P < 0.001$). Diamond exhibits significant differences ($P < 0.001$), showing greater CTE values from the other groups. N100 exhibits little ($P < 0.05$) or no difference ($P > 0.05$) with temperature rise. N100 exhibits great differences in higher temperatures when compared with the other GICs ($P < 0.001$).

Conclusions: Different types of GICs show various CTE results in terms of quantity and quality. Typical GICs contract in temperature raise, while resin-modified GIC expands. Also, it seems that changes in GIC acid composition alter thermal behavior in higher temperatures.

P06-110

Retention of glass carbomer fissure sealant after 12 months of clinical trial

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Background: Glass Carbomer represents a new generation of dental glass material developed from glass-ionomer cement material. Advantages of Glass Carbomer are the high wear resistance, the no acid-biocompatibility, the high F release and the incorporation of the fluorapatite particles.

Aim: The aim of this study was to investigate retention of Glass Carbomer fissure sealant after 12 months of clinical trial.

Design: Forty-eight teeth with well-delineated fissure morphology divided in two groups were sealed with glass carbomer (Glass Carbomer Sealant, Glass Carbomer Products, Netherlands) and Heliocore F (Vivadent, Liechtenstein) using split mouth design. Materials were placed and set according manufacturer's instructions using polymerization unit Bluephase 16i (Vivadent, Liech-

tenstein). Teeth in group A were sealed with Heliocore F and in group B with Glass Carbomer material.

Results: Results showed that complete retention in-group A and B were 75% after 12 months of clinical follow up. There were two new carious lesions in each group. Mann-Whitney U-test didn't reveal statistical significant differences between groups.

Conclusions: Glass Carbomer material showed comparable retention rate and can also be recommended for everyday practice. However, a long-term follow up is required to get reliable results.

P06-111

Biological performance of ha binding biomimetic acrylic resin or PGA coating of titanium implants in the dog mandible

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Aim: The aim of the present study was to analyze the *in vivo* effect of HA binding biomimetic acrylic resin or poly glycolic acid (PGA) coating of titanium implants on perimplant bone formation and bone-/implant contact.

Design: Three types of implants were used: (i) Titanium implants with a polished surface (G1); (ii) Titanium implants with HA binding acrylic resin coating (G2); (iii) Titanium implants with HA binding PGA (G3). All implants had cylinder cross sections with a diameter of 2.5 mm and were inserted press fit into trephine bur holes of 3.8 mm in the mandibles of six beagle dogs. Tensile bond strength between the bone and titanium implants was measured in a universal testing machine. The implants of three animals each were evaluated after a healing period of 1, 3 and 6 months, respectively, during which micro-computed tomography (μ -CT) of bone formation had been performed. Bone formation was evaluated by morphometric measurement of the newly formed bone around the implants and the percentage of implant bone contact by μ -CT.

Results: Titanium implant (G1) showed the highest bond strength value (30.5 ± 4.8 MPa). The μ -CT scan analysis revealed that bone mineral density (BMD), bone mineral content (BMC), and volumetric density (BV/TV) were all increased in a time dependent manner in all groups. These results did not change after 3 and 6 months. After 3 months, new bone formation was significantly higher in titanium implants (G1) compared to G2 and G3. BV/TV (%) of titanium implants (G1), G2 and G3 were 30.6 ± 4.1 , 12.0 ± 3.1 and 16.7 ± 4.6 respectively, at 6 months.

Conclusions: These results indicate that the titanium group allows more rapid mineralization and osteogenesis than other groups, which is consistent with the *in vivo* μ -CT.

P06-112

The comparison of microtensile bond strength of composite restoration to eroded enamel by surface treatment

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Background: Composite resin has been widely used for eroded enamel. But, as there have been many reports about the differences in physicochemical characteristics between eroded and sound enamel, an additional effort was thought necessary for optimal bond strength. As a possible answer, we came to think about the application of infiltrant resin, known to have an excellent penetration capacity into enamel.

Aim: This study was performed to compare the bond strength of composite restoration with adhesive or infiltrant resin on the artificially eroded enamel.

Design: Sixty extracted sound maxillary primary incisors were selected and divided into groups A, B, C according to the number of artificial erosion cycling in citric acid of pH 3.2. Labial surfaces were divided into three areas; group 1, only resin adhesive, group 2, only infiltrant resin, group 3, infiltrant resin followed by resin adhesive, then restored with composite resin. Microtensile bond strength was measured and failure modes were observed.

Results: Comparing the bond strength by the degree of enamel erosion we found that the lowest bond strength was observed in the most eroded group ($P < 0.05$). In comparing the bond strength by surface treatment methods, groups 3 and 2 showed higher values than group 1 ($P < 0.05$), with insignificant difference between group 2 and 3 ($P > 0.05$). Regarding the failure mode, we found the higher frequency of cohesive failure in order of A-B-C and 3-2-1.

Conclusions: There is a decreasing tendency of bond strength as the enamel is more eroded. Infiltrant resin is thought to be helpful to replace or add to the resin adhesive for optimal bonding with eroded enamel.

P06-113

Comparison of the microleakage of two materials used as fissure sealants with different methods

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Background: Marginal seal has a principle role in durability and clinical success of fissure sealants. In addition to marginal discoloration, microleakage can result in caries recurrence and failure of treatment.

Aim: The aim of this study was to compare the microleakage of two materials used as pit-and-fissure sealants with different methods of application.

Design: Fifty-five extracted premolars were assigned randomly to one of the following five groups: Group 1: acid-etching (Ultra Etch) + fissure sealant (conventional method), Group 2: acid-etching + bonding agent (single bond) + fissure sealant, Group 3: self-etching primer + bonding agent (SE) bond + fissure sealant, Group 4: self etching primer + bonding agent + flowable

composite (Filtek Flow), Group 5: self etching primer + bonding agent + flowable composite. Following sealant placement the teeth were thermocycled (3000 cycles; 5–55°C) and then immersed in 50% silver nitrate solution for 24 h and then immersed in photo developing solution for 4 h under fluorescent light. The teeth were then sectioned in a buccolingual direction. Microleakage was scored using a stereomicroscope and a 4-criteria ranking scale. Data were analyzed statically using Kruskal-Wallis and Mann-Whitney tests and SPSS software.

Results: Kruskal-Wallis test showed that there are statically differences between some groups. Mann-Whitney test showed that group 2 and 4 have the lowest leakage scores and group 3 and 5 have the highest scores and statistically significant differences could be displayed between them ($P < 0.05$). Mean microleakage in group 4 was also significantly lower than in group 1 ($P < 0.05$).

Conclusions: The finding of this study showed that regardless of the material, using acid and a bonding agent prior to the sealant placement seems to be the best technique for sealing pits and fissures in order to have minimal microleakage.

P06-114

Microleakage of class V compomer resin restorations after conventional diamond bur and ER, CR: YSGG laser preparation

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Aim: The aim of this study to compare the microleakage of class V compomer resin restorations (Dyract Extra) prepared by erbium, chromium:yttrium-scandium-gallium-garnet (Er,Cr:YSGG) laser or conventional diamond bur.

Design: Ninety sound primary molar teeth were randomly assigned to one of six study groups, pretreated as follows: Group 1; 2 W–10 Hz Er,Cr:YSGG laser irradiation, Group 2; 2 W–20 Hz Er,Cr:YSGG laser irradiation, Group 3; 2,5 W–10 Hz Er,Cr:YSGG laser irradiation, Group 4; 2,5 W–20 Hz Er,Cr:YSGG laser irradiation, Group 5; 3 W–10 Hz Er,Cr:YSGG laser irradiation, Group 6; 3 W laser–20Hz Er,Cr:YSGG laser irradiation. Each tooth hosted one test cavity prepared with one of the Er,Cr:YSGG laser irradiation and one control cavity prepared with a conventional diamond bur in a high-speed hand piece. Both cavities were placed at the cervical margin of the tooth and were restored and finished according to the manufacturer's instructions. Sample teeth were subjected to thermocycling (5–55°C for 500 cycles) and stored in distilled water at 37°C for a month. Microleakage was assessed using 0.5% basic-fuchsin dye penetration technique and was quantified using a score 0 (none) to 4 (to and into the axial all). The data was analyzed using the Kruskal-Wallis and Wilcoxon Signed Ranks Test.

Results: There were no statistically significant differences in microleakage ($P > 0.05$) at either enamel and dentine margins between groups. Test cavities demonstrated statistically significant less microleakage compared to control cavities at both enamel and dentin margins in Group 4 and 6 ($P < 0.05$).

Conclusions: Cavity preparation Er,Cr:YSGG laser did not influence microleakage of compomer resin restorations adversely. 2,5 W–20Hz and 3W–20Hz Er,Cr:YSGG laser irradiation may be a alternative to conventional diamond bur.

P06-115

SDR versus traditional composite. A RCT on paediatric patients

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Background: There is insufficient evidence from the dental literature to make any recommendations about which filling material to use in paediatric dentistry. Choices in these areas are made on clinical preference.

Aim: The aim of this study is to evaluate the clinical behaviour of aesthetic restorations in Class II preparations in primary molars by using two different materials.

Design: The authors conducted a randomized clinical trial. Twenty-eight patients received 56 restorations in primary molars randomly assigned by lottery method in a split mouth technique: 28 restorations with traditional universal microfilled composite and 28 restorations with SDRTM (Dentsply). Two examiners, whose technique has been calibrated, evaluated the restorations using modified U.S. Public Health Service criteria at baseline and at 3, 6, 9 and 12 months.

Results: After 1 year, there were no statistical differences between SDR and traditional composite about Marginal Adaptation, Anatomical Form, Cavosurface Margin, Discoloration, Axial Contour, Secondary Caries and Visible Plaque Index. However, there was a decreasing odd ratio and a $P < 0.05$ between the two materials regarding the Proximal Contact.

Conclusions: At the 12-month clinical recall, the authors found no differences among SDR and traditional composite in Class II restorations in primary molars. SDR showed a good behaviour and it was very appreciated by the patients and by the authors for its fast and easy manipulation.

P06-116

Effects of pacifier use on the developing dentition of 9- to 36-months-old Japanese children: preliminary study

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Background: The influence of pacifier sucking on dental arch characteristics and development has long been recognized. Many studies have found that use of pacifier is a risk factor for malocclusion while the duration of the habit is an important factor in occlusal disturbance. The effect of pacifier use has been addressed by relatively few studies in Japan.

Aim: The purposes of this study were to compare: (i) the occlusion of 9- to 36-months-old former pacifier users with habit-free children of the same age, (ii) The effects on the occlusion of conventional and functional pacifiers.

Design: Thirty-five children were recruited and enrolled into this study. Questionnaire data on sucking habits were collected the children were examined and study models were obtained. Data

regarding occlusal development were collected. Differences in occlusion were assessed between former pacifier users ($n = 23$) and habit-free children ($n = 12$), as well as between the two pacifier groups.

Results: Pacifiers were reportedly used a mean of 7.3 months. Open-bite was not found for both groups. There were no detectable occlusal differences between pacifier users and habit-free children, but those who sucked pacifier had a tendency towards a spaced lower labial segment. Anterior cross-bite and proclined upper incisors, where more frequent among conventional pacifier users, but did not differ significantly with the users of functional ones.

Conclusions: Sucking functional pacifiers for short duration may not affect oral development.

P06-117

Influence of aging on experimental gastrointestinal motility in extraction of molar teeth rats

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Aim: The purpose of the present study was to determine whether different consistency of diet and malocclusion induced by the extraction of molar teeth on the masticatory organs modulated gastric acid secretion, gastric emptying and intestinal transit in young and elder rats.

Design: Male Wistar rats (young, 5 weeks; elder, 1.5 years) were used, and were divided into two groups according to age and then I two subgroups: group one (G1) was maintained with solid diet, group two (G2) with mud diet. The mandibular molar teeth of G2 were extracted. The experimental period was 60 days. The effect of aging and malocclusion on the parameters of gastric secretion was examined using pylorus-ligated rats. The gastric emptying rate (GER) and small intestinal transit rate was determined in rats by Evans blue from the stomach and charcoal from the small intestinal, respectively.

Results: In pylorus-ligated Young-G2 rat the gastric juice volume, acid output and pepsin secretion remarkably showed significant decrease in comparison to Young-G1 group, but were almost the same in the elder rat groups. GER of Young-G2 rat group was $43.1 \pm 6\%$, significantly lower than that of Young-G1 rat group ($58.8 \pm 10\%$, $P < 0.01$), but GER of Elder-G1 rat group was not significantly different from the Elder-G2 rat group. In small intestinal transit rates of charcoal meals, G1 and G2 of young were 73.3 ± 9 and $55.1 \pm 8\%$, respectively, and Elder groups were 61.7 ± 9 and $52.6 \pm 7\%$, suggesting an insignificant effect on diet.

Conclusion: These results suggest that the diet and malocclusion, induced by extraction of mandible molar teeth of young rats, may have a great influence compared to elder rat groups.

P06-118

Effects of finger sucking on dental characteristics in the primary dentition: three-dimensional dental arch and palatal form analysis

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Background: Several studies have reported the effects of prolonged finger sucking on certain dental arch measurements such as decreased maxillary arch width and increased lower arch width. However, the effect of finger sucking on the palatal vault dimensions is not clearly stated.

Aim: The purpose of this study was to compare the dental arch and palatal vault form, of 3- to 4-year-old children with finger-sucking habit, to children of the same age with no non-nutritive sucking habits.

Design: Forty-one children were enrolled into this study: 21 children with finger-sucking and 20 children without non-nutritive habits, who served as controls. Analysis of the maxillary arch and evaluation of palatal morphology were accomplished from reformatted CT scans from plaster casts of the maxilla. Digital computerized measurements of the transverse dimensions and cross-sectional morphology of the palate were performed.

Results: Dental arch width was significantly smaller in the finger-sucking group in the inter-canine and inter-molar regions. It was also found that finger-sucking children had significantly smaller values for palatal vault width at the second primary molar regions than habit-free children. However, the palatal heights on the midline at the various part of palate were not significantly different between finger-sucking group and control group.

Conclusions: These results suggest that finger-sucking may produce a significant effect on the transverse dimension of the maxilla. However, longitudinal studies are needed to evaluate the various dental arch and alveolar ridge parameters in both maxillary and mandibular dental arches.

P06-119

Premature loss of 1st primary molars. Is there a need for space maintenance? Systematic review and meta-analysisD. LAZARIDOU¹, D. TSANTOU¹, E. G. KAKLAMANOS², S. ARIZOS¹ & N. KOTSANOS¹¹*Department of Paediatric dentistry, Aristotle University of Thessaloniki, Greece;* ²*Private practice, Thessaloniki, Greece*

Background: Space maintenance is indicated in premature loss of second and first primary molars before full eruption of permanent first molars, while controversy exists regarding the need for space maintenance after premature loss of first primary molars when permanent molars have totally erupted.

Aim: The purpose of this systematic review was to investigate the changes in dental arches after a unilateral premature extraction of primary first molars, as regards to space changes in the extraction region compared to the contra lateral side.

Design: Citations to potentially relevant trials were located by searching the appropriate databases, the random effects method

for meta-analysis was used to combine the trial outcomes and the risk of bias was assessed by considering potential threats to validity.

Results: Five trials were considered appropriate for inclusion. Two trials on lower first molars were located and showed statistically significant greater space loss in the extraction side compared to the control, after 8 months (1.50 mm, $P = 0.000$). Three trials presenting data on upper first primary molars were retrieved and did not reveal a statistically significant difference in space loss after 12 months (0.50 mm, $P = 0.064$). The included studies presented increased risk of bias.

Conclusion: The magnitude of space loss after unilateral premature loss of first primary molars may not be clinically significant, even in the mandible, although the retrieved studies may bear limited proofing ability. Further well-designed trials are needed in order to reach firm conclusions and critical thinking should characterize clinical decisions in individual cases.

P06-120

Phenotypic and genotypic features of familial hypodontia in Saudi familiesS. ALFAWAZ¹, F. WONG¹, M. HECTOR¹ & D. P. KELSELL²¹*Institute of Dentistry, Barts and The London School of Medicine and Dentistry, Queen Mary, University of London, UK;* ²*Centre for Cutaneous Research, Blizard institute, Barts and The London School of Medicine and Dentistry, Queen Mary, University of London, UK*

Background: Family studies show that hypodontia, as an isolated form, can be caused by mutations in the MSX1 or PAX9 genes, with an autosomal dominant trait of inheritance. However, additional genes are likely to underlie both dominant and recessive hypodontia. In Saudi, consanguineous marriages are common and we have identified a number of families suggestive of autosomal recessive hypodontia.

Aim: This study aimed to determine the type of inheritance and phenotype of familial hypodontia in Saudi families, and identify its genetic basis.

Design: The family pedigree of a large Saudi family (109 individuals) with hypodontia was constructed and phenotyped. Saliva samples were collected using a OG- 500 DNA Collection kit[®]. The DNA was extracted manually from 500 µL saliva/Oragen DNA solution. Four affected DNA samples were genotyped using high density single nucleotide polymorphism (300 000 SNPs) Infinium arrays.

Results: The family pedigree includes 17 affected members with autosomal recessive non-syndromic hypodontia with varying degrees of penetrance, eight of the 17 affected members have microdontia and three of them have impacted canine(s). The pedigree suggesting that the same recessive hypodontia gene mutation was segregating within this large pedigree. Based on this pedigree structure, one branch of the family was targeted for homozygosity mapping using high density SNP arrays. Four subjects were genotyped and large blocks of homozygosity were scored. Our data suggest that MSX1 and PAX9 genes are not associated with hypodontia in this family.

Conclusions: We have characterised the first large family with recessive hypodontia and we are currently conducting investigations to detect mutations for the candidate genes.

P06-121

Prevalence and distribution patterns of molar-incisor-hypomineralisation (MIH) using different index teeth

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Background: MIH is described if EH are present on at least one first permanent molar (PFM). Frequently the permanent incisors are affected as well. Unfortunately, only limited information about the distribution pattern of EH/MIH are available.

Aim: This epidemiological study aimed to analyse the distribution of enamel hypomineralisations (EH) and its influence on the determination of the prevalence of Molar-Incisor-Hypomineralisation (MIH).

Design: Therefore, 693 children (10.2 years) of the GINIplus cohort study were examined in Munich, Germany. The GINIplus study is an ongoing birth cohort study, initiated to prospectively investigate the influence of nutrition intervention during infancy with the development of allergies. Demarcated opacities, enamel disintegrations and atypical restorations were registered on all permanent teeth (HT)/surfaces (HS). Each child was categorised according to the following groups: (i) EH on at least one PFM (1–4 PFM AND 0–8 incisors), (ii) EH on PFM and permanent incisors (1–4 PFM and 1–8 incisors) and (iii) EH on other permanent teeth (incisors, canines, premolars).

Results: The mean number of EH amounted to 0.8 (± 1.5) HT/1.1 (± 2.3) HS among the whole study population. 14.7% of all children were classified to group 1 [(3.4 (± 1.9) HT/4.8 (± 3.8) HS], 9.4% to group 2 [4.2 (± 1.8) HT/5.9 (± 4.1) HS] and 21.8% to group 3 [(1.5 (± 0.9) HT/1.6 (± 1.1) HS]. Demarcated opacities were recorded in ~90% of all hypomineralised teeth/surfaces.

Conclusions: It can be concluded that different distribution patterns are linked with different prevalence rates. EH should be recorded on all primary and permanent teeth/surfaces to gain more information about the important question which threshold(s) should be applied to identify subjects with EH/MIH.

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P06-122

Factors affecting the treatment duration of forced eruption of impacted incisors: a retrospective study

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Background: Forced eruption is a procedure performed to facilitate eruption of impacted tooth. However the long duration required is a major concern.

Aim: The aim of this study was to evaluate the average treatment duration of forced eruption on impacted upper incisors and the possible factors that affected the treatment time.

Design: Twenty-four patients (mean 8 years and 9 months-old), with 25 upper impacted incisors were included in this study. Factors analysed included the age at the beginning of treatment, the distance from impacted incisor edge to the occlusal plane, presence of odontoma or supernumerary tooth, the crown orientation (normal, horizontal, or inverted crown position), eruption space loss and presence of root dilaceration. Standardized panoramic radiograph was used as a measurement tool. The data were analyzed using Kruskal–Wallis test, Mann–Whitney *U*-test and linear regression methods.

Results: The average treatment duration was 12.7 months. The treatment duration was positively correlated with the distance from the incisor edge to the occlusal plane ($R^2 = 0.21$; $P = 0.02$). No significant correlation was found between the treatment duration and age ($R^2 = 0.32$; $P = 0.1$). The presence of the other variables increased the treatment duration, however, the results were not statistically significant.

Conclusion: The factor that can be used as an estimate of time needed to complete the forced eruption technique is the distance from impacted incisor edge to the occlusal plane.

P06-123

Comparison of root end closure technique in nonvital teeth using MTA & Ca(OH)₂ paste

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Background: It takes up to 3 years after the eruption of permanent teeth for the completion of root development and apical closure. During this period, if pulp undergoes necrosis, either due to trauma or carious process, no further development and maturation of root is possible which results in an open apex. Endodontic management of such teeth complicated due to canal size, walls of root canals being divergent and obturation also difficult. The treatment for such teeth includes root end closure technique also known as apexification. Traditionally, Ca(OH)₂ paste have been considered as the material of choice, however is time consuming and unpredictable. Recently MTA, Mineral trioxide aggregate, has evolved as a potential apical barrier material that allows early obturation of root canals.

Aim: To evaluate and compare Ca(OH)₂ and MTA with respect to their efficacy and time taken for apexification.

Design: Study carried out on 30 nonvital teeth with open apices (20 maxillary central incisors and 10 mandibular molars) in 25 children from 7 to 16 years-old. Fifteen teeth were randomly allocated to Ca(OH)₂ group while 15 were managed with MTA paste. Endodontic procedure along with apexification was performed for both groups.

Results: In both groups, treatment was successful in all teeth, however, Ca(OH)₂ paste took more number of visits and hence more time for apical barrier formation than in teeth treated with MTA.

Conclusions: Both Ca(OH)₂ & MTA pastes are an effective agents for apical closure in these teeth. MTA can be an appropriate alternative for Ca(OH)₂ paste for root end closure technique.

P06-124

Comparison between calcium hydroxide and MTA effects during regenerative endodontic treatment with triple antibiotic mix

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Introduction: The purpose of this study was to compare the effect of triple antibiotic mix (ciprofloxacin, metronidazole, minocycline)/calcium hydroxide and triple antibiotic mix/MTA used as intracanal medication during regenerative endodontic treatment of immature teeth in four patients.

Case report: These case report present the four patients who were treated with triple antibiotic mix as intracanal medication. Clinically, gingival swelling and fistula were detected in all four patients. All teeth had open apices associated with radiolucency and periodontal ligament space widening. Two patients, each with one immature permanent tooth, were treated with triple antibiotic mix as intracanal medication. One week later, the triple antibiotic mix was removed and the calcium hydroxide powder with sterile saline was applied in the coronal portion of the canals. The access cavities were filled with IRM. After three months, IRM was replaced with Glass Ionomer (Fuji II LC, GC). The teeth of the other two patients were treated with triple antibiotic mix. One week later, triple antibiotic mix was removed and MTA was applied above the blood clot. The access cavities were sealed with wet cotton and IRM. Finally the teeth were restored with composite resin (Z-100, 3 M).

Comments: The symptoms disappeared within a week after applying triple antibiotic mix in all cases. Also, the periapical radiolucencies decreased and periodontal ligament space and lamina dura became normal in all cases. Comparing the dentinal

wall thickness radiographically, the cases which were treated with calcium hydroxide showed thinner dentinal wall than the cases treated with MTA.

P06-125

Two years follow up of traumatized tooth treated with revascularization

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Introduction: Traumatized immature permanent teeth are difficult to treat. In many cases the doctors try different approaches without any results. Usage of the new method of revascularization helps in continuing root formation.

Case report: A 12-year-old girl was referred for evaluation and treatment. There was history of trauma on left upper central incisor, two years ago with a swelling that appeared 6 months later. The patient was presented with an immature permanent central incisor with pulpal necrosis and apical periodontitis. The girl was treated by several dentists, but no one was able to seal up and restore the tooth. The canal had remained open and exposed to the oral environment. The tooth had a severely destroyed crown and red-brown staining. The tooth was treated with NaOCl irrigation and medicated with ciprofloxacin and metronidazole, followed by a revascularization procedure adopted from the trauma literature. At the 12-month recall, the patient was asymptomatic. At the 24-month follow-up the patient continued to be asymptomatic, no sinus tracts were evident and apical periodontitis was resolved.

Comments: The method of revascularization and its modifications give successful results in traumatized immature teeth left untreated for a long time.

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P07-126

Awareness of Greek dental practitioners on issues of child abuse and neglect

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Background: Dentists may often be the first health professionals to come in contact with signs of child abuse and neglect (CAN).

Aim: To describe the training and experience of Greek dental practitioners regarding the diagnosis and management of abused and neglected children.

Design: A random sample ($n = 440$) was drawn from a target population of dentists registered with two of the largest dental associations in Greece. The dentists were interviewed by two paediatric dentists using a modified version of the questionnaire by Cairns et al (2005). Information was collected regarding the dentists' awareness on CAN, the frequency of suspected incidents and the reasons of not reporting them.

Results: With a response rate of 83.6%, findings are reported from 368 interviews (54% male, mean age = 43 years). Only 21% of respondents had received training on child protection during undergraduate studies. The percentage of dentists that suspected abuse and neglect was 13% and 35%, respectively. Only six out of the 368 respondents, made an official report of a suspected case of CAN. Forty four percent (44%) of respondents were reluctant to report an incident because of doubt over diagnosis. Ninety seven percent (97%) of dentists believed that diagnosis and reporting of incidents should be part of undergraduate training.

Conclusion: Although dental practitioners were willing to report suspected cases of CAN they did not feel adequately informed on diagnosis and management. In Greece, there is a great need for continuously educating dentists on CAN and setting up an organized system for reporting such incidents.

P07-127

Impact of social status and time of the first dental visit on children behaviour and dental chart

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Background: Dental treatment is often associated with emotional strain especially for children.

Aim: The objective of the present study was to find out whether children's behaviour during dental treatment is more influenced by time of the first dental visit or social status. Furthermore, the effects of both factors on oral health are reviewed.

Design: In this study, 88 patients participated. The questionnaire consisted of different parts: dental chart, parents' professions, time of first dental visit and fear-related questions. Children were graded

according to the Sarnat Behaviour Scale. Results were statistically analysed using the chi-square test.

Results: The time of children's first dental visit influences the children's behaviour more than their social status ($P < 0.05$). Children who visit the dentist early show a more cooperative behaviour ($P < 0.05$). The dental chart is affected by both factors equally. Parents with an academic background are often associated with children who show a good oral health ($P < 0.05$). Children who visit the dentist at an early age are also more likely to have a less number of decayed, missing or filled teeth ($P < 0.05$).

Conclusions: Parents with a high social status are often better informed about oral hygiene measurements and prophylaxis. Their children often have better results in their dental chart. An early visit to the dentist enables the child to have a playful approach in the dental treatment process. Coping strategies can be developed early by the children.

P07-128

Role play in paediatric dentistry – making composed and confident dentists? Patient and student perspectives

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Background: Children's behavioral management is considered an integral part of Pediatric Dentistry and teaching this topic represents a challenge to dental educators. This study assessed role play as a behavioral management teaching tool within the pediatric dentistry module in addition to the planned lectures.

Aim: The aim of this study was to evaluate students' perception towards the role play as a teaching format and effectiveness of this teaching tool on the students' patient management skills from the patients perspectives.

Design: The Anxiety and Behavior Management module was being taught by plenary to fourth year dental students before Role Play was introduced in 2009. The study compared students' perception towards the module for the batches of 2008 (cohort 1) and 2009 (cohort 2). The study was extended to involve patients' perception toward the treatment received by their patients via a questionnaire for 6–9 years-old patients asking them to rate the level of satisfaction with their treatment. Where students of both cohorts had treated the patients, patients were also asked which treatment they had preferred.

Results: Student's perception towards the module was positive in general. Ninety percent of the students in cohort 2 felt that they were prepared to manage anxious children compared with 75% of cohort 1. Patients' perception also showed a more positive response towards the treatments received by cohort 2. Eighty-one percent of the patients treated by cohort 2 felt satisfied by their treatment, compared with 60% of cohort 1. Where both cohorts had treated a patient, 58% patients felt more satisfied with cohort 2 as compared with 36% of cohort 1.

Conclusions: Role play in undergraduate education appears to have a positive influence on the depth of knowledge and delivery of care to young children.

P07-129

Children's viewpoint on dental treatment

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Background: A child's dental experience has normally been prejudged as unpleasant and threatening causing fear and anxiety. Thus, the need to do some research on models that will promote oral health in a biopsychosocial perspective.

Aim: The aim of this study is to investigate dental treatment from the child's viewpoint using the Theory of Social Representations leading to the building of a practical knowledge, creating inter-relationships between the social actors, the phenomenon and the surrounding.

Design: The participants consist of children from primary schools in the 6–10 age group, who had undergone dental treatment within the previous year or were being treated at the date of collection. Drawing-and-Story Procedure was used in this research.

Results: The results of the analyses of the content of the children's Drawing-and-Story enabled us to understand their reactions not only to the dental treatment (49.5%) but also to the dentist image (30%) and psychological surrounding (20.5%).

Conclusions: This study revealed both the viewpoint of children towards dental treatment and their need of being treated by professionals that communicate and interact in a creative and playful manner thus decreasing the anxiety and negative feelings of these young patients.

P07-130

The impact of maternal attachment on children's cooperative behaviour during dental examination and treatment in the United Arab EmiratesA. HOSIN¹, E. OKEEFE¹ & W. AL JANABI²¹London Metropolitan University, London, UK; ²Sheikh Khalifa Medical City, Abu Dhabi, UAE

Background: Practitioners within health care systems appreciate the psychosocial factors in shaping outcomes during treatment. Attachment Theory has wide applications in child development. Secure Attachment behaviours protect children from physical and psychological harms.

Aim: This project is an attempt to investigate the relationship between attachment and behavioural outcomes of children during dental treatment.

Design: Around 260 participants (130 parents & 130 children 3–13 years-old), all attending two primary health centres in Abu Dhabi; were given questionnaires (the Relation Questionnaire RQ, Bartholomew & Horowitz, 1991) to ascertain both child and parental attachment behaviour. Frankl Behaviour Rating Scale (Frankl et al., 1962) was also used to assess the cooperativeness of

the children during treatment. Informed consent and confidentiality were considered and addressed before starting the data collection. SPSS was utilized to analyze the data and Chi-square and Pearson's correlations were used.

Results: More than 50% of the children were identified as cooperative, the rest being identified as uncooperative. Girls manifested more often uncooperative behaviour than boys. About 63.4% of those who were categorized as securely attached to their mothers were also cooperative, and 77.8% of the fearful children displayed uncooperative behaviour.

Conclusions: Psychosocial factors, particularly child's attachment to the caregiver impacts on the child's behaviour in dental settings. It would appear, should effective child-focused care be delivered, that this emerging body of psychosocial evidence be integrated and become a prominent component of any future professional development courses designed for dental health practitioners.

P07-131

Evaluate the anticonvulsant and anxiolytic action of indigoferasuffruticosa millG. B. LINDOSO-COUTO¹, T. MALHEIROS¹ &E. ALMEIDA²¹Paediatric Dentistry, Federal University Of Pernambuco – Brazil;²Pharmacy, Brazil

Background: Indigoferasuffruticosa Mill, popularly known in Brazil by Anil do Campo, is used as antispasmodic, sedative, diuretic and antiinflammatory agent.

Aim: The present study had as objective to evaluate the anticonvulsant and anxiolytic action of this plant through the methanolic extract of its leaves.

Design: Swiss albinics mice had been submitted to doses of 100, 300 and 500 mg/kg of the methanolic extract. For inquiry of the anticonvulsant action, the animals had suffered the action from the following convulsants: Pentylenetetrazol 100 mg/kg, Picrotoxin 10 mg/kg, Estricnine 2 mg/kg, Pilocarpin 600 mg/kg and Lidocain 200 mg/kg. In the evaluation of the anxiolytic action of the plant, the mice were submitted to the Elevated Plus Maze and the Test To Hide the Spheres. Diazepam was used in all the experimental models as standard drug, in the doses of 2 mg/kg for the anticonvulsant tests and 1 mg/kg for the anxiety tests.

Results: The methanolic extract demonstrated anticonvulsant action, increasing the time of latency for the beginning of the first convulsion in all the tests. The ideal dose from the methanolic extract was 300 mg/kg. Although the evidence of its anticonvulsant action, and therefore depressive action of the Central Nervous System, it was not observed any anxiolytic action in none of the tested doses.

Conclusions: The results of this study demonstrate that this is a promising plant for future studies in the development of new anticonvulsants drugs.

P07-132

Psychometric properties of the Chinese version of the modified CFSS-DS

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Background: Childhood dental fear has been shown to be widespread. One approach to explaining, identifying, and reducing dental anxiety is developing an effective measurement can be used in clinical and research settings.

Aim: To translate the faces version of the modified Children's Fear Survey Schedule-Dental Subscale (CFSS-DS) and adapt it to specific circumstances of Chinese children. This study also aimed to investigate its psychometric properties (validity and reliability).

Design: The Chinese-version CFSS-DS was derived through a forward-backward translation and randomly administered to children (5–12 years) and their parents before dental examination. The children's behavior was recorded and rated using the Frankl Behavior Rating Scale (FBRs). The reliability of the translated scale was evaluated in terms of internal consistency using Cronbach's alpha and corrected item-total correlation. Construct validity was evaluated by factor analysis, and criterion-related validity was evaluated using the parental report of the modified CFSS-DS and Frankl scale. Formal psychometric properties were tested according to the standard procedure of the translation of English version scales.

Results: A Chinese-version modified CFSS-DS was derived. A total of 367 children were surveyed. The Cronbach's alpha of the translated scale was 0.87. Fifty-one patients completed the questionnaire twice at two separate visits, and test-retest reliability was 0.72. Corrected item-domain correlation ranged from 0.58–0.90. A certain logical relationship between the items among the same domains was observed. A significant association among the self-report of the modified CFSS-DS.

Conclusion: The developed Chinese version of the modified CFSS-DS demonstrates acceptable reliability and validity.

P07-133

Uncooperative children: parental, child, and treatment variables

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Background: Uncooperative children pose challenges to dentists, and dentists may not always be able to predict which child will be uncooperative. In pilot work, fearful mothers tended to have uncooperative daughters, while fearful fathers had uncooperative sons.

Aim: The aim of this study was to investigate parental, child, and treatment variables which might be related to uncooperation in children aged 4–12.

Design: In a cross-sectional study, consecutively-seen parents whose children attended a paediatric private practice completed questionnaires, while the dentist independently rated the children's cooperation with the Frankl scale.

Results: To date, 160 mother-daughter, 113 mother-son, 68 father-daughter, and 50 father-son pairs have participated. Among mothers only, younger children were less cooperative, and daughters who received anesthesia were less cooperative. Highly educated parents had more cooperative sons, but there was no relationship for daughters. There were no relationships between parental age, dental visit habits or self-ratings of oral health and child cooperation. Mothers gave significantly more threats to their uncooperative daughters, and fathers gave significantly more threats to their uncooperative sons. Fathers were also significantly more likely to bribe their uncooperative sons. While there were no relationships between maternal fear and giving threats or bribes, fearful fathers were more likely to bribe their daughters, and there was a trend ($P = 0.056$) for them to give more threats to their daughters.

Conclusions: The relationships between parental fear, child cooperation, and other variables are complex. It is likely that cultural differences in rearing sons and daughters may impact cooperation.

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P07-134

Istanbulian Greek minority school children's dental attire choices in relation with dental anxiety

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Aim: The present study aims to assess Istanbulian Greek minority school children's preferences regarding four different dental attires and its relation with anxiety.

Design: Regarding anonymised photographs, 69 children (aged 9–14 years) were asked to look at anonymised photographs note, in order of their preferences, which dentist (wearing four alternative attires) they would choose 'if they had been to dental clinic'. Children's Fear Survey Schedule – Dental Subscale (CFSS-DS) was used to evaluate children's anxiety level.

Results: The formal attire was the first preference for 52.2% of the children ($n = 36$), followed by the child friendly attire with a preference rate of 23.2% ($n = 16$). Twenty-five children (36.2%) were diagnosed as anxious (CFSS-DS ≥ 32) and 44 children (63.8%) were diagnosed as non-anxious (CFSS-DS < 32). There were no significant difference between anxious and non-anxious children regarding first to fourth choice of attire preferences ($P > 0.05$). First preferences were compared according to mean anxiety scores and children preferring the child friendly attire were observed to be the highest anxious group ($P = 0.023$).

Conclusions: The popular view that children are fearful of white coats is not found in this survey. However, the concept of 'Child friendly' attire might be more appropriate for anxious children and enhance an easy first communication with them.

P07-135

Interrelationship between IQ and cooperation in dental clinic among 5–7 year-old childrenB. AJAMI¹, E. DOOSTDARI¹ & M. TABATABAIE²¹*Paediatric Dentistry, Mahhad Dental School, Mashhad, Iran;*²*Psychiatric Department, School of Medicine, Mashhad, Iran*

Background: The child management is the major factor in pediatric dentistry, therefore, studying children's behavior and understanding the related factors, may help us to find out suitable ways to manage them in the dental office.

Aim: The aim of this study was to evaluate the relationship between IQ and cooperation of 7 years-old children in dental offices.

Design: In this study, 33 children (16 male and 17 female) between 5 and 7 years-old were selected. These children had no previous dental experiences and no mental or physical disabilities which needed special care. First of all, children's IQ was estimated by a psychologist with Reven Children's Test (colored progressive matrices) in their kindergarten. Children's behavior was classified according to Frankle's Behavioral Rating scale during three different dental visits: (i) dental examination, (ii) prophylaxy and flouride therapy and (iii) restorative dental treatment using injection. The statistical tests used were: *t*-student Mann–Whitney, Kruskal–Walis, ANOVA, Spearman Correlation, General Linear Model.

Results: Results showed that in the first session, the child with the higher IQ had the less cooperation and in the other hand, when IQ is lower, the cooperation was increased.

Conclusions: At the first session, the IQ had negative influence on child's behavior, in a dental office.

P07-136

Child abuse in ancient mythology: a retrospective study

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Introduction: The aim of this review is to describe child abuse cases in ancient Greek Mythology. Greek Mythology is one of the most ancient in the World. Many cases of child abuse are described there and some of them, the most famous will be presented here. Some times, abused children at a later stage of their life become child abusers.

Case report: Names like Hercules, Saturn, Aesculapius, Medea are very familiar. The stories can be divided in three categories: child abuse from gods to gods, from gods to humans and from humans

to humans. In these stories children are abused in different ways and the reasons are social, financial, political, religious, medical and sexual.

Comments: The interpretations of the myths differ and the conclusions seem controversial. Archaeologists, historians, and philosophers still try to bring these ancient stories into light in connection with the archaeological findings. In controversy to the myths, ancient Greek carefully protected children as the heir of their land. Nevertheless, these stories tend to play a prominent role to the social aspect of child abuse.

The possibility for a dentist to face a child abuse case in the dental office nowadays proves the fact that child abuse is not only a phenomenon of the past but also a reality of the present.

P07-137

A case report of an abused child referred by a paediatric dentist

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Introduction: Child abuse can be defined as a non accidental trauma failure to meet basic needs or abuse inflicted upon a child by the caretaker that is beyond the acceptable norm of childcare in our culture. All dentists should be able to recognize the signs and symptoms and be familiar with the reporting laws of their respective country. The crucial factor is the fight against child abuse is the early recognition of the problem and the role of dentists in such occasions is crucial.

Case report: The main step in the identification of suspected child abuse and neglect is the general physical assessment of the child for example the extraoral injuries, bruises or abrasions and bite marks and the oral lesions i.e. loosened or fractured teeth. This presentation aims to report a case of physically abused child 2.5 years-old from its mother. The examination revealed facial marks of four fingers of the attacker's right hand on the victim's cheek, from a hard violent slap to the face. When the mother was asked for her behavior she gave as an explanation the crying due to the eruption of the primary teeth.

Comments: Dentists should be aware that abuse may result in oral or dental injuries, so they must be encouraged to recognize such findings, meticulously observe and document them, and institute steps that might save the child's life. The problem with recognition is the awful realization that parents treat harmfully their defenseless children.

Poster Session P08/Dental Trauma 1

P08-138

Association of bucco-dental trauma types in handicapped patients

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Aim: The aim of this work is to verify the percentage of occurrence of dentofacial injuries among handicapped students, that are diagnosed with cerebral paralysis, Down syndrome, autism and attention-deficit/hyperactivity disorder. All these patients are registered in institutions placed in Belém-Pará: CEDi, IONPA, SABER, Pestalozzi Foudation and APAE.

Design: Two hundred and forty-one students of institutions for handicapped people in Belém of Pará were used in this study. One hundred and fifty-seven of them had cerebral paralysis, 65 Down syndrome, 11 attention deficit/hyperactivity disorder and eight autism.

Results: The most frequent types of dentofacial injuries were: enamel and dentine fractures with 26.89%; concussions with 25.81% and enamel fractures with 24.74%. The dental group most frequently involved was the superior central incisors with 82.29% followed by the group of the superior lateral incisors with 14.58%. The most frequent causes of the traumatic injuries were the falls (walking, running, of the hammock, of the bed and of the chair), with 32.82% and the children games with 22.38%. 28.36% of the patients did not know the cause of the trauma. The dentofacial injuries occurred most frequently in children between 0 and 7 years-old (51.86%), followed by children 7 and 14 years-old (48.14%). The most frequent place of the trauma was at home with 54.42%, while 29.41% of the patients did not remember where the trauma occurred.

Conclusions: The highest occurrence of the dentofacial trauma is observed in males. Fractures of the enamel and dentine of the upper central incisors caused mainly from falls in students aged from 0 to 7 years-old, that occurred at home have the highest occurrence.

P08-139

Horizontal root fractures

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Introduction: Horizontal root fractures are uncommon lesions accounting for 0.5–7% of traumas that occur in the permanent dentition. Horizontal fractures occur most commonly in the middle-third of the root and rarely in the apical-third. They involve the tooth's supportive tissue, dental pulp and mineralized structures, affecting predominantly the middle-third of upper incisors from male patients during the second decade of life. Indeed, root fractures can be associated with bone alveolar fracture. The literature indicates that many factors may influence the type of healing which occurs. These factors include the stage of root development, repositioning of dislocated fragments and any

associated signs and symptoms, such as mobility and pain. Although the outcome of a root fracture is generally favorable, complications such as pulpal necrosis, radicular resorption and pulpal canal obliteration can arise. Therefore, after adequate clinical management, it is fundamental that the patients are followed up during a certain period of time for clinical treatment success.

Case report: The present paper reports two root-fractured teeth treated by repositioning and fixation with good healing at the 3-years follow-up examination.

Comments: The loss of vitality of the fractured teeth and sclerosis of root canals can usually be observed approximately at the end of the first year with the possibly slow changes. A minimum observation period of 2 years is recommended for traumatized teeth with no apparent complications.

P08-140

Pilot study of the tug-back tactile sensation and voids detected in the apical area of filled root canals

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Background: Although master cone adaptation is considered an important factor in the development of a hermetic apical obturation, a few experimental data has been so far reported.

Aim: The purpose of this study was to evaluate the presence of voids after the filling of root canals using adapted and non-adapted master cones.

Design: Thirty-seven human mandibular incisors were instrumented using the step-back technique and randomly divided into two experimental groups: Group A ($n = 18$): adapted master cones with tug-back tactile sensation (resistance to remove), not necessarily in proportion to the master apical file, were used to obturate the root canals. Group B ($n = 19$): non-adapted master cones in proportion to the master apical file, without evaluating its tug-back, were used. Master cones were fitted to calculated working length using AH26 sealer and canals were obturated by the lateral condensation technique. Afterwards, anatomical apexes of the roots were cut until the gutta-percha had been detected and digital photos were taken. Area of gutta-percha and root canals as well as the contact surfaces between them were measured using an image analysis software.

Results: More contact surfaces between the gutta-percha and the canal walls were detected in group A (65.77%) comparing to group B (53.19%) while larger voids were found in group B (39.57%) comparing to group A (29.33%) without significant differences between the groups ($P > 0.05$).

Conclusions: Voids were present in both techniques with or without tug-back tactile sensation. It seems that tug-back technique was favorable because of lesser voids and more contact surfaces of gutta-percha with the canal walls found in this pilot study. However, more research is needed.

P08-141

Different possibilities for direct restorations of a single missing anterior tooth reinforced with polyethylene fibers – report of casesH. JURIĆ¹, J. MATIJEVIĆ² & I. MEDVEDEC³¹*Department of Paediatric and Preventive Dentistry, School of Dental Medicine, Zagreb, Croatia;* ²*Department of Endodontics and Restorative Dentistry, School of Dental Medicine, Zagreb, Croatia;*³*Department of Endodontics and Restorative Dentistry, School of Dental Medicine Split, Croatia*

Introduction: Loss of an anterior tooth represents a serious aesthetic and functional problem. Patients are often psychologically traumatized and prompt treatment is required. Adhesive restorations reinforced with polyethylene fibers represent a fast and efficient chair-side solution for such loss. Also, these restorations are aesthetically adequate and functionally viable. Ribbond® fiber is a clinically proven reinforcement system and, because of its properties, is suitable for use in the anterior area.

Case report: Three possible treatment procedures exist: using a patients' own tooth crown for the reconstruction; using a denture tooth in the reconstruction; and, using composite resin for the replacement of the missing tooth. In the present report of cases, the clinical procedure and final outcome of all three suggested restorative treatment of single missing anterior tooth reinforced with polyethylene fibers will be presented.

Comments: Adequate results can be obtained with all three methods, but using a patients' own tooth has been shown to be the simplest and most predictable procedure. With a cooperative and aware patient and regular check-ups, adhesive restorations reinforced with polyethylene fibers can be a semi-temporary or even a long-term solution.

P08-142

Evaluation of parents' and teachers' attitude in emergency management of dental trauma

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Background: Immediate management of traumatized teeth is known to be important for long-term success. Therefore, the attitude and knowledge of schools staff and parents about immediate appropriate management of the situation is very important.

Aim: The aim of this study was to evaluate the knowledge and attitude of primary school teachers and parents, in regards to emergency management of dental trauma.

Design: Data were collected by A self-administered questionnaire. A three-part questionnaire comprising of questions on demographic data, attitude and knowledge was distributed to teachers and parents. In the study 343 persons (163 teachers and 180 parents) participated.

Result: The teachers' attitude was better from parents, but teachers' knowledge was not better from parents. The parents with a higher educational background had a higher knowledge and better attitude. Fifty-one percent of parents and 44.8% of the teachers believed that an upper anterior traumatized tooth of 8 year-old child is permanent. Twenty-nine percent of the parents and 36.8% of the teachers agreed that an avulsed permanent tooth should be replanted. Eleven percent of parents and 25.5% of the teachers believed that milk is the best medium, but most of them would select a disinfectant solution. Twelve percent of the teachers and 25.1% of the parents stated that they would be prepared to replant an avulsed tooth themselves. Most of the teachers and parents stated the correct timing for replantation (30 min or less). Finally 68.9% of parents and 26.4% of teachers stated that they needed more education in this matter.

Conclusion: This study showed that educational programs are necessary to increase teachers' and parents' awareness of the immediate management of traumatized teeth.

P08-143

Replantation of an avulsed permanent maxillary incisor: case report of a 9-year follow up

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Introduction: Tooth avulsion represents 0.5–16% of traumatic injuries and it is most common type of dental injuries that usually occur to maxillary central incisors.

Case report: This case report presents a 18-year-old female patient who have had avulsion of the left permanent maxillary incisor, 9 years ago. After avulsion the tooth was placed in saline, where it was kept, from the moment of trauma, until its replantation, 30 min later. The tooth was replanted and stabilised with a composite splint. Endodontic treatment started 4 days later and it was carried out for a year. The endodontic treatment consisted of periodical changes of calcium hydroxide dressing, and a fineroot canal filling with gutta percha points and sealer. Seven years after the injury, the patient had orthodontic treatment with fix appliance in which the avulsed tooth was not involved.

Comments: After appropriate treatment and regular 9 year check-ups, the tooth was in place without any clinical or radiographic complications.

P08-144

Dentoalveolar trauma management at the oral and maxillofacial department of a children's hospital: 10 years experience

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Background: Dentoalveolar trauma is one of the common causes which bring young patients to the hospital emergency room. Apart from teeth injury, soft tissue lacerations and alveolar fractures, requiring surgical intervention, may exist. In almost all cases involvement co-operation with Paediatric Dentists is essential.

Aim: To present the surgical treatment of severe dentoalveolar injuries in children.

Design: Patients with severe trauma treated in our department under general anaesthesia during the period 2000–2010, were included in the study. Data were retrieved from their files and were evaluated together with recent clinical and radiographic findings. In all cases, the injured area was thoroughly examined; clots and debris were removed, the fractured bone was manually repositioned, soft tissue lacerations were sutured and injured permanent teeth were splinted following reposition in occlusion. Patients were referred for further treatment of the dental trauma.

Results: Thirty-eight young patients out of 71 treated for dentoalveolar trauma, had suffered severe injury. Alveolar process fracture involved the alveolar plate alone or it was combined with the supporting the teeth bone or was segmental fracture of the process involving multiple teeth. In 31 cases, severe teeth displacement or avulsion co-existed (in 17 cases extrusion-intrusion-luxation and in 14 cases dental avulsion). In seven severe cases a segment of displaced bone including the teeth was dislocated. Osteosynthesis was required for fixation in five cases. Satisfactory results were recorded in every case.

Conclusion: Severe dentoalveolar trauma requires surgical management and co-operation with Paediatric dentists.

P08-145

Traumatic dental injuries in primary dentition

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Introduction: Traumatic injuries involving the alveolus, usually lead to functional and aesthetic problems, especially when they are not treated properly. Epidemiological studies show that tooth luxation is more frequent in primary than in permanent dentition, due to

differences in the consistency of bonnie tissue. Regarding Tooth luxation is more frequent in upper central and lateral incisors.

Cases report: Three cases of children, who visited the clinic of Pediatric Dentistry of the University of Buenos Aires with luxation of primary teeth and involvement of the alveolar bone are presented. After proper diagnosis, the treatment was to splint the affected teeth with a positioning plate for 45 days. With this type of splint, strength spreads out and is absorbed by the jaw, avoiding trauma during mastication and favouring bone healing with no sequelae.

Comments: Since pulp and periodontal complications may occur after trauma, clinical-radiographic follow ups are essential and must be carried out frequently in order to obtain favourable outcomes.

P08-146

Dental trauma knowledge and treatment attitude among dental therapists in Singapore

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Background: Dental trauma is very common since more than 50% of school age children suffer dental trauma before age 15. The peak period for permanent teeth trauma is between ages 8–12. In Singapore, dental therapists are the main service provider in Primary Schools; hence they are likely the first to manage any trauma.

Aim: This study aims to evaluate the self-perceived knowledge and ability of the dental therapists to manage dental trauma of the permanent incisors.

Design: A three-part questionnaire was completed by 189 dental therapists. The first part contained the personal and professional information of the therapists while the second part evaluated their knowledge about emergency management of permanent incisors. The last part investigated their attitudes and the barriers to the management of dental trauma.

Results: From the therapists, 75% with 21–30 and 87.5% with more than 40 years of experience, have come across avulsion in their years of practice. 80.3% of these therapists will re-implant the tooth before referring to a dentist. 58.2% of therapists reported that pulp capping is sufficient for delayed complicated crown fracture while 18.5% reported that Cvek pulpotomy is a better treatment. 36.0% of therapists reported that a lack of knowledge in managing trauma will stop them from providing emergency treatment and 57.7% reported that they need more knowledge to handle dental trauma.

Conclusions: The majority of the therapists were knowledgeable regarding the management of traumatised permanent teeth. However, further training may be beneficial to boost their confidence in handling dental trauma.

P08-147

Knowledge and awareness of oral-dental trauma among parents of primary and preschool children in IstanbulR. ONER¹, D. OZDEMIR-OZENEN¹, E. SUNGURTEKIN¹, H. ISSEVER² & N. SANDALLI¹¹*Faculty of Dentistry, Department of Pedodontics, Yeditepe University, Turkey;* ²*Faculty of Medicine, Department of Biostatistics, Istanbul University, Turkey*

Background: Awareness of parents and school teachers regarding dental trauma is very important since they are the first to interfere with the child at the time of traumatic injury. It is well-known that a delay in seeking emergency management of dental trauma might lead to undesirable outcome.

Aim: The aim of this study was to evaluate the level of knowledge and awareness of parents of primary and preschool children regarding oral and dental traumatic injuries.

Design: A total of 540 parents willingly participated to the present study. A questionnaire was given to parents via their children attending primary and preschools in Istanbul. This questionnaire had three parts as the first for demographic data and dental trauma experience. The second part contained questions on subjective self-assessment of attitude and awareness, and the third part dealt with objective evaluation of knowledge on the availability of emergency services for dental trauma, and the management of avulsed and fractured teeth.

Results: Overall, the parents' basic knowledge of trauma was found satisfactory. 85.7% of the participants were aware of the importance of attending an education program regarding dental injuries. In terms of seeking emergency, 65% said that they would get immediate help from a dental professional.

Conclusion: Mostly, parents were aware of dental trauma management and most of these were university graduates and professionals. Therefore, further public education programs should be implemented to spread out knowledge and awareness regarding dental trauma.

P08-148

Alveolar bone loss after the early loss of upper central incisor in growing children

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Introduction: Prevalence of traumatic loss of the maxillary incisors in children is about to 1.2%. Tooth avulsion accounts for 0.5–3% of permanent dentition trauma and has the highest incidence at the age of 7–9 years. Complications of early loss of the central incisors include loss of vertical and horizontal width, height, contour of

alveolar bone, tilting of adjacent teeth, arch length loss and esthetic compromise. Furthermore, alveolar bone loss may affect function, stability and esthetic appreciation of future prosthesis restoration.

Case report: A 9 year-old girl and a 6 year-old boy visited the Department of Pediatric Dentistry, Yonsei University Dental Hospital, with the chief complaint of traumatic avulsion of a maxillary incisor. Alveolar bone resorption pattern was analysed 5 year 8 months and 3 year 9 months, after the loss of the central incisor respectively. Alveolar bone loss was observed especially on the labial region of the edentulous area.

Comments: The age of a patient at trauma, the degree and vector of trauma, and the period of tooth loss influence morphological change in alveolar bone. The alveolar bone loss of the maxillary central incisor area in growing children results in esthetic problems and deficiency in alveolar bone mass that complicate future prosthetic treatment, including implantation.

P08-149

Treatment of horizontal fractures in immature central incisors: a case reportE. O. AKGÜN¹, M. C. HAYTAÇ² & M. C. DOĞAN¹¹*Faculty of Dentistry, Department of Paediatric Dentistry, Cukurova University, Adana, Turkey;* ²*Faculty of Dentistry, Department of Periodontology, Cukurova University, Adana, Turkey*

Introduction: Apexification treatment of immature teeth with calcium hydroxide paste is associated with some difficulties, such as the long time duration of the paste and the possibility of trauma. This is a case of 11-year-old female with a horizontally fractured maxillary central incisor during apexification procedure.

Case report: An 11-year-old female who suffered a traumatic injury during apexification procedure presented to our clinic in Cukurova University. Teeth number 11 and 21 were fractured below the gingival margin. First, the gingiva over the roots were removed and then the root length assessments with successful apical closures were determined. Root canal treatments were done with thermo-plastic synthetic polymer-based root canal filling material and dual curable dental resin composite sealer. Teeth were restored with packable glass ionomer restorative material, temporarily. One week after the obturation hook shaped wires were embedded into the canal using dual cure bonding agent and a core was build from composite resin for the extrusion of the roots. Root extrusions were maintained with a removable appliance for 3 months. Finally, teeth were restored with resin core build-ups and full ceramic crowns.

Comments: At 1 year follow up both teeth were healed successfully. Treatment of horizontal fractures in immature teeth necessitates multiple appointments and could be expensive. On the other hand, keeping the alveolar ridge thickness for the prosthetic procedures in the future should be the first aim.

Poster Session P09/Morita Prize 2- Clinical Research- Dental Anxiety and Behavioural Management 2- Special Needs Patients 2

P09-150

Effectiveness of analgesics in pain management and anxiety in pediatric dentistry

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Background: The pain associated with dental treatment causes anxiety disorders in pediatric patients. Analgesics raise the pain threshold.

Aim: Prove the effectiveness of analgesics in increasing the pain threshold and avoiding the triggering of anxiety disorders.

Design: A double-blind study was carried out with 60 patients from the pediatric dentistry clinic; we used ibuprofen in 20 patients, paracetamol in 20 patients and placebo in 20 patients group control. Patients were evaluated using the Venham Scale and Facial Pain Scale.

Results: The results for the Venham Scale showed that: 39 from the 60 participants were relaxed, 17 anxious, three tense, one reluctance. According to the Facial Pain Scale, eight patients were without pain, 33 with very mild pain, 14 mild pain, four moderate pain, one severe pain. The analgesics were effective in 36 patients: 16 ibuprofen, nine paracetamol and 11 placebo.

Conclusions: The use of analgesics was effective in increasing the pain threshold and avoiding this anxiety. Ibuprofen was the most effective.

P09-151

Analysis of related factors of oral habits in children

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Aim: To investigate the related factors of oral habits through a questionnaire survey in children with sucking, nail biting, lip biting and tongue thrusting habit, and to assess the psychological status of these children.

Design: Test group included 90 children with oral habits, aged 4–9 years-old. Their parents were asked to fill the Achenbach Child Behavior Checklist (CBCL) and the investigation questionnaire. Control group 1 included 72 children without oral habits. Their parents were asked to fill the CBCL. Control group 2 included 93 children without oral habits. Their parents were asked to fill the investigation questionnaire.

Results: Significant factors related with the four oral habits were the oral habits of relatives, communication between parents, family income and sleep disorders and the OR (odd ratio) were 11.856, 5.109, 2.300, and 5.152 respectively. The average score of CBCL was 15.64 ± 13.45 in the test group, and 10.55 ± 8.78 in the

control group. Sixteen children in the test group compared to only two in the control group had behavior problems. The difference was statistically significant.

Conclusions: The probability of having behavior problems were higher in children with the habits of sucking, nail-biting, lip biting and tongue thrusting. Oral habits of relatives, communication between parents, family income and sleep disorders were the related factors of sucking, nail-biting, lip biting and tongue thrusting habits in children.

P09-152

Changes in empathy during dental training in Thessaloniki, Greece

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Background: Some evidence suggests that empathy levels drop when dental students begin to see patients. It would be desirable to understand this phenomenon more fully.

Aim: The aims of the study were to evaluate the Greek version of the Toronto Composite Empathy Scale (TCES), which contains four subscales measuring cognitive and emotional empathy in personal and professional domains, and to examine the relationships between the subscales and other variables.

Design: In a cross-sectional design, 382 dental students from Aristotle University of Thessaloniki completed a questionnaire which included the TCES, a measure assessing dental competencies, a dental version of the Attitudes Towards Patient Education Scale (ATPES), and the Modified Dental Anxiety Scale (MDAS).

Results: The Greek TCES showed good reliability (Cronbach's alphas 0.692–0.809) and validity ($p < 0.001$). Higher cognitive empathy was associated with higher dental competencies ($p < 0.001$) and greater preference to work with patients who are educated about their dental needs and active participants in treatment decisions (ATPES; $p < 0.001$). Professional cognitive empathy dropped significantly in the year in which student began to see dental patients and remained lower through the end of training. Higher emotional empathy was associated with higher dental fear (MDAS; $p < 0.001$). Professional emotional empathy did not vary by year of dental training.

Conclusions: Professional cognitive empathy declined when students' exposure to patients increased, although professional emotional empathy did not. The two types of empathy appear to be tapping different aspects of the dentist-patient relationship.

P09-153

Dental anxiety and fear: a survey of Turkish children

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Background: Dental fear (DF) in children has been recognized as one of the most troublesome problems in pediatric dentistry for many years; however the etiology of DF is not entirely understood.

Aim: The aim of this study was to determine children's dental anxiety and fear using the Children's Fear Survey Schedule- Dental Subscale (CFSS-DS) and the Facial Image Scale (FIS).

Design: A sample of 150 children aged 8–12 completed the Turkish version of the CFSS-DS and FIS in the pediatric dental clinic of Istanbul University, Faculty of Dentistry, Istanbul. The response format ranges from one (not afraid at all) to five (very afraid), giving a score range from 15 to 75. The scores of 38 and above indicated of high dental fear. FIS comprises a row of five faces ranging from very happy to very unhappy. The children were asked to point at which face they felt most like at that moment.

Result: The mean total score was 31.68 ± 8.25 for CFSS-DS for FIS. No significant differences in FIS scores between boys (2.35 ± 1.16) and girls (2.36 ± 1.20) were found. However, in total CFSS-DS scores for boys (30.22 ± 8.40) and girls (33.19 ± 7.86) showed a significant different statistically. CFSS-DS was found to be equally reliable (Cronbach alpha = 0.755).

Conclusion: Children's dental fear and anxiety during dental treatment seem to consist of many different factors. An accurate assessment of dental anxiety is necessary to overcome the problems related to individual diagnosis and treatment.

P09-154

Greek parents' acceptance of behavior management techniques used in paediatric dentistry

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Background: Few studies, none in Greek population, have studied parental acceptance on behaviour management techniques.

Aim: The aim of this study was to examine Greek parents' acceptance on behaviour management techniques.

Design: Following the approval by the Ethics Committee, all parents whose 3–12 years-old children were treated for three consequent weeks in our Postgraduate Clinic ($n = 37$) and in a private paediatric dentistry practice ($n = 122$) were invited to participate. Parents were shown a video with nine behaviour management techniques and rated their acceptance in a 0–10 scale. Subsequently, parents had to complete a questionnaire about dental experience, dental fear (MDAS) and demographics.

Results: Best accepted technique was tell-show-do while least accepted techniques were passive restraint and general anaesthesia. No correlations were found between acceptance and parental age, gender, income, education, dental experience and dental fear or the child's age, gender and dental experience. Parents were asked to choose between general anaesthesia or restraint, hand over mouth and voice control. 10% preferred general anaesthesia and these parents presented higher negative dental experience ($\rho = 0.3$, $P < 0.05$). Parents at the University had lower income ($\rho = 0.4$, $P < 0.05$) and education ($\rho = 0.4$, $P < 0.05$) and rated passive restraint, sedation and general anaesthesia higher than those at the private practice ($\rho = 0.4$, $P < 0.05$).

Conclusion: Our results agree with two existing studies. In addition, parents with negative dental experience prefer general anaesthesia than restraint, hand over mouth and voice control. There was significant difference between parents at University and private practice regarding income, education and rating of passive restraint, sedation and general anaesthesia.

P09-155

Evaluation of a novel behaviour prediction scale

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Background: Behaviour of a child is an integral factor in treatment planning. Proper assessment of a child's behaviour helps the dentist in rendering effective and efficient dental treatment. Predicting the child's behaviour in the waiting room adequately equips the dentist and his team in child management.

Aim: To evaluate a specially prepared questionnaire as a predictor scale of child's behaviour during their first dental visit and to compare them with Frankl behaviour rating scale.

Design: The questionnaire used in the study was a dentist assessment 10 point observational scale. Observations involved perceiving overt and subtle behavioral characteristics of a child, to assess the child's behaviour in the dental office before treatment. Eighty-five children in the age group of 3–12 years (mean = 6.8 years) participated in this study. Children and their parents were approached in the waiting room by an independent observer (A). The child's behavior was evaluated by dentist and independent observer (B) using Frankl behaviour rating scale during and after treatment.

Results: The new behaviour prediction scale was compared with the Frankl rating scale to evaluate their prediction correlation. There was a positive correlation between the two scales ($r > 0$). Successful prediction was achieved in 92% of the samples studied.

Conclusion: This novel behaviour prediction scale may prove to be of great importance to predict children's behaviour in the dental environment.

P09-156

Oral manifestations of cancer treatment in Mexican children

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Background: The protocols used for management of oral complications of cancer treatment in Mexican children, lack evidence, because they are not based on research in this population.

Aim: This study determined the prevalence of oral manifestations in pediatric oncology patients receiving chemotherapy, and evaluated the significance of independent risk factors (oral health, gender, age, time and type of treatment and chemotherapy phase).

Design: A cross-sectional study was made in 35 children with cancer between 1 and 16 years of age. A clinical examination was conducted and the OHI-S index was used to describe periodontal health and the oral mucosa rating scale to assess oral pathology.

Results: The prevalence of oral manifestations was: caries, 17%; mucositis, 11%; mucosal petechiae, 7%; xerostomy, 41% and induced ulcers, 30%. The prevalence of oral infections (candidiasis and recurrent herpes) was 2%. It was observed that severe cancer, stage of chemotherapy and poor oral hygiene were important risk factors for the development of caries, xerostomy and mucositis.

Conclusions: Acute lymphoblastic leukemia, gender and phase of chemotherapy were associated with the presence of xerostomy and oral mucositis and could be considered risk factors for these conditions. This study provides baseline information to enable the construction of randomized clinical trials to test methods of prevention and proposed interventions for oral complications in Mexican children.

P09-157

Evaluation of adaptability for dental treatment of autistic patients by developmental test

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Background: Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by severe deficits in social interaction and communication. Individuals with ASD often show problematic behavior and refusal behavior during dental treatment.

Aim: The aim of this study was to evaluate the adaptability for dental treatment of ASD patients by using the Enjoji-developmental test.

Design: The subjects were 14 patients with autism (13 men, 1 woman, age range 18–40 years) living in community housing. Data was collected from their caregivers in community housing using the Enjoji-developmental test. Patients with autism were trained to cooperate to dental treatment by mechanical tooth polishing or composite resin restorations were used to train the patients with autism to cooperate during dental treatment. The number of training sessions and the results of the developmental test were statistically analyzed using Welch's t test.

Results: Eight patients with autism were above and six were below the 3 year/10 month fundamental habits limit, in the Enjoji-developmental test. It has been reported that the 3 year/10 month limit of the Enjoji-developmental test is the discrimination point. The number of training sessions was significantly lower in the above 1 the 3 year/10 month limit than the below.

Conclusion: These results indicate that Enjoji-developmental test may be used to evaluate the adaptability for dental treatment of ASD patients.

P09-158

Clues from saliva in autistic children

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Background: Autism is a disorder with uneven intellectual development. Dental treatment can be challenging in these children as they react with tantrums, for small environmental changes with enormous variation and tendency towards aggressive and self injurious behavior (SIB).

Aim: The purpose of this study was to assess the various SIB in autistic and non autistic children and to estimate and correlate the salivary testosterone and cortisol levels in both groups.

Design: This is a prospective observational study. Children between 6 and 10 years, including 50 healthy (controls) and 33 autistic (study group) participated in the study. The study group was further divided into medium and low functioning. Salivary sampling for cortisol and testosterone quantification was done. Various SIB were tabulated in both groups.

Results: Significance in the statistical analysis was assessed using Spearman's rank correlation. A positive correlation between salivary testosterone and cortisol ($r = 0.657$), and a negative correlation ($r = -0.192$) in the study and control respectively are observed. Kruskal–Wallis test was done to test the significance of the various SIB. Elevated levels of cortisol were found as SIB increased, and this was statistically significant ($P = 0.024$), though increase in levels of testosterone with SIB was not statistically significant, ($P = 0.505$).

Conclusion: Data from our study identified autistic children had multiple SIB, which was self mutilating compared to the healthy controls. This was further correlated to elevated salivary cortisol and testosterone levels, which may be reflective on their aggressive behavior patterns. Clinically this data will be helpful in clinical behavior-management and treatment modifications.

P09-159

An integrated care pathway in the management of medically compromised patients requiring dental treatment under general anaesthesiaK. FORDE¹, T. KANDIAH^{1,2} & C. MASON¹¹Maxillofacial and Dental Department, Great Ormond Street Hospital for Children NHS Trust (GOSH), London, UK; ²Unit of Paediatric Dentistry, Eastman Dental Hospital, University College London Hospitals NHS Foundation Trust (UCLH), London, UK

Background: General Anaesthesia (GA) for paediatric dental treatment is widely accepted for the pre-cooperative and un-cooperative child, where intervention is justified. At GOSH, a multidisciplinary team provide holistic treatment planning for medically compromised children undergoing comprehensive dental care under GA.

Aim: To assess the medical status, nature and extent of treatment and outcome for patients treated in an integrated care pathway at GOSH.

Design: A retrospective cohort study of patients treated during 2009 ($n = 141$) utilised data extracted from the available hospital records ($n = 126$).

Results: The study group comprised of 126 patients (82 male; 44 female), mean age 7 years 6 months (range 2–15 years; median 7 years). Dental caries was the most common diagnosis (113/126, 90%). The American Society of Anaesthesiologists (ASA) status revealed significant medical co-morbidity (ASA III and IV: 65/126, 52%). Comprehensive dental care undertaken included preventive measures (121/126; 96%), dental extractions (121/126; 96%), adhesive resin restorations (101/126; 80%) and preformed metal crowns (SSC) (23/126; 18%). 24/126 (19%) of patients received concurrent medical intervention. All patients entered a regular review programme: GOSH (62/126; 49%), Community Dental Services (37/126; 29%), General Dental Practice (17/126; 14%), other hospital (10/126; 8%). To date, none of the cohort have required repeat GA.

Conclusions: An integrated care pathway minimises the need for repeat GA and reduces morbidity in high risk patients. Multidisciplinary planning, intra-operative assessment, strict treatment criteria and follow-up are integral to this approach.

P09-160

Molar incisor hypomineralization in down syndrome patientsC. NARANJO-CAMILA¹, M. J. VICUÑA², A. ORMEÑO¹ & R. TAPIA¹¹Los Andes University School of Dentistry, Santiago, Chile; ²Private Practice, Chile

Background: Molar Incisor Hypomineralization (MIH) syndrome has been barely investigated in patient with Down syndrome (DS), which suffers a lot of diseases that are involved on the aetiology of MIH.

Aim: Determine the prevalence and severity of MIH syndrome in children with Down syndrome in Santiago of Chile.

Design: Descriptive prevalence study. Previously informed consent, 54 subjects were selected ($n = 54$), 37 men (68.5%) and 17 women (31.5%) with Down syndrome between 6 and 23 years-old (average 11.1). A calibrated examiner (intra examiner kappa index 0.76) performed a dental examination to record the presence of MIH and catalogue their severity (assessed by classification of enamel defects in molars and incisors of Weerheijm et al.) and a survey tutors about the medical conditions that participants had experienced the first three years of age. STATA v.10.1. software was used to analyze the results and a Fisher exact test with 95% confidence interval was used to determine the presence of significant variables by reference to a $P \leq 0.25$.

Results: The prevalence of MIH was 18.5% ($n = 10$). We found no statistically significant association between the presence of MIH and gender, nor gender and degree of severity ($P = 0.257$). The severity was grade 1 in all affected.

Conclusions: The prevalence and severity of MIH in this study is similar to that found in studies of children without Down syndrome.

P09-161

The approach to dental treatment for patients with Ataxia Telangiectasia in Israel

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Background: Ataxia-telangiectasia is rare, autosomal recessive neurodegenerative disorder. Signs and symptoms include Cerebellar ataxia, Telangiectasia, Immunodeficiency, Chromosomal disorders and hyper-sensitivity to ionizing radiation and an increased incidence of malignancies (primarily hematologic). They suffer of high incidence of caries. One of the reasons for that is their oral muscle impairment. An important basic defect associated with this disease is the abnormal sensitivity of ataxia-telangiectasia cells to x-rays and certain radiomimetic chemicals, which leads to chromosome and chromatid breaks. This defect imposes difficulties in dental treatment, since x-rays examination is prohibited in these patients.

Aim: The purpose of this study was to evaluate the dental pathology in patients with Ataxia Telangiectasia and the dental treatment methods that can be used.

Design: In Israel 58 children are known to suffer of Ataxia-telangiectasia. A retrospective analysis of clinical data was performed on 23 patients with Ataxia-telangiectasia who underwent dental examination at the Sheba medical center, Israel.

Results: Although, Ataxia-telangiectasia is reported in all races, most of our patients (14) were of families of the Beduin ancestry. Of the 23 patients (17 males, six females), 20 needed dental treatment although only 11 arrived to our clinic for treatment. Five patients underwent dental treatment under local anesthesia and six underwent treatment under general anesthesia. Almost all of the patients underwent dental treatment without any x-ray examination.

Conclusions: Our goal should be early referral of these patients for prevention of dental diseases.

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P10-162

Knowledge of cardiac patients and carers about infective endocarditis at a paediatric cardiology clinic with regular oral health input

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Background: In York Hospital (UK) all paediatric cardiology clinics have an oral health educator (dental therapist) present. Preventive advice is given and referrals to specialist care are made if considered appropriate. The clinic is one of 17 satellite cardiology clinics from Leeds General Infirmary but is the only clinic to benefit from regular dental therapist attendance.

Aim: The primary aim was to examine the dental attendance and knowledge of infective endocarditis (IE) of parents and children attending the paediatric cardiology clinic.

Design: A prospective audit involving questionnaires during five cardiology clinics in 2010. The gold standard was that all paediatric cardiology patients should have regular access to dental services and that all patients at increased risk of IE should be aware of this.

Results: Of 113 patients who attended the clinic, 87 patients participated. The mean age was 6.6 years (SD 5.3). 62% (54/87) of the patients were male. Twelve referrals were made to specialist services. 56/67 of patients at increased risk of IE had regular access to dental services. 26/67 of the parents with at increased risk children were aware of their child's risk status. Those who had regular access to dental services and who had been previously seen for dental education at the cardiology clinic had significantly better knowledge of whether their child was at increased risk of IE ($P < 0.05$ according to Fisher's exact test).

Conclusions: Not all patients attending the cardiology clinic had regular access to dental care despite being high priority. Furthermore, knowledge of IE was poor.

P10-163

Pattern of cleft lip and palate deformities and associated dental anomalies in a beneficiary population: a preliminary report

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Background: Orofacial cleft is one of the major human congenital malformations seen in live births. Port Harcourt is a city in the oil rich South-South region of Nigeria for which there is a dearth of data on orofacial cleft deformities.

Aim: To assess the pattern of cleft lip and palate deformities and associated dental anomalies in a Nigerian population.

Design: This is an observational study of the dental/occlusal features of patients with cleft lip and/or palate. Thirty-six subjects were recruited from among the beneficiaries of a surgical outreach at the University of Port Harcourt Teaching Hospital. Data collection was by oral interview and clinical examination. The

information elicited was recorded in a structured questionnaire and data was analyzed using SPSS 17.

Results: The age range was 0.21–28 years, with an age of 8.78 years (± 8.21). Eight (22.6%) subjects were below the age of 1 year. Twenty-five percent had cleft lip (CL), 33.3% had Cleft Palate (CP), and 41.7% involved lip and palate (CLP). In general, higher prevalence rates were found for males (52.8%) than females (47.2%). CP, however, was common in females. Unilateral CL (50%) was more frequent than bilateral CL (16.7%). Left and right unilateral cleft constitutes 33.3% and 19.4% of total clefts respectively. The Dental/occlusal anomalies, which were seen in the study, include hypodontia (17.8%), microdontia (21.4%), enamel hypoplasia (21.4%), ectopic eruption (14.2%), natal tooth (3.6%), rotated tooth (60.7%) and anterior crossbites (32.1%).

Conclusions: Although this study is ongoing; observed pattern of cleft is consistent with the literature. Tooth rotations were the commonest anomalies.

P10-164

Paediatric dental care under general anesthesia in unit for specialized oral care of the city of Helsinki

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Background: Dental care under general anesthesia (GA) in Helsinki is centralized to Unit for Specialised Oral Care. The main indications for GA are dental fear, lack of co-operation, young age or medical condition.

Aim: Was to evaluate the characteristics of the child population treated.

Design: The data was collected from the dental files of the patients treated under GA during a six month period between 1st Jan 2009 and 30th Jun 2009. It included the medical and dental diagnoses, age, gender, and information of the origin of the child (a native of Finland or an immigrant).

Results: A total of 140 children were treated. Sixty-two percent of the patients were boys and the mean age was 7.0 years. Eighty-seven percent of the patients had no underlying long term illness, 6% were mentally handicapped, 3% had a neurological disorder, and 1% each had a syndrome, cancer, or bleeding disorder. The main dental diagnosis was caries (93%). 10.7% of the patients had earlier undergone dental care in GA. 46% of the patients were of other than Finnish origin. A strong correlation between dental care in GA and immigration status was found: odds ratio for immigrants under 6 years was 8.3 (95% CI 5.4–12.7) and for the older children (7–15 years) 3.1 (95% CI 1.7–5.5) compared to native Finnish children from Helsinki area.

Conclusions: The results show that immigrants have a higher risk for dental care in GA. Thus education and preventive dental care in early childhood for immigrants should be endorsed.

P10-165

Oral health behaviours of preschool children with cerebral palsy: a case control community based study

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Background: Cerebral palsy (CP) describes a group of permanent disorders attributed to non-progressive disturbances in the fetal or infant brain which affects the development of movement and posture. The worldwide prevalence of CP ranges from 1.3 to 3.6/1000 live births.

Aim: To describe and compare oral health behaviors of preschool children with and without CP, and to assess the oral health knowledge and attitudes of their primary caregivers.

Design: Seventy-two preschool children with CP were recruited from 23 Special Child Care Centers in Hong Kong. An age (± 3 months) and gender matched sample of children from mainstream preschools were recruited as the 'control group'. Assessment of children's oral health behavior as well as primary caregivers' oral health knowledge and attitudes was conducted.

Results: Preschool children with CP were less likely to have ever attended a dentist when compared to children without CP ($P < 0.05$). Children with CP were more likely to have experience of a general anesthetic for dental treatment when compared with children without CP ($P < 0.05$). Tooth brushing frequency was similar between the two groups ($P > 0.05$), but primary caregivers of children with CP more frequently reported providing tooth brushing assistance to their children ($P < 0.001$). Primary caregivers in both groups had similar oral health knowledge ($P > 0.05$) and attitudes ($P > 0.05$).

Conclusions: Primary caregivers of children with and without CP have similar oral health knowledge and hold similar oral health attitudes. However, differences in oral health behavior exist between preschool children with and without CP; particularly with respect to dental attendance.

P10-166

Comprehensive dental care under general anesthesia in Helsinki University children's hospitalE. SALO^{1,2}, A. HANDOLIN², H. ALAPULLI^{1,2} & S. ALALUUSUA^{1,2}*¹Department of Oral and Maxillofacial Diseases, Helsinki University Central Hospital, Helsinki, Finland; ²Department of Paediatric and Preventive Dentistry, Institute of Dentistry, University of Helsinki, Finland*

Background: Helsinki University Central Hospital (HUCH)/Children's Hospital provides dental care under general anesthesia (GA) mainly for medically compromised children living in Southern Finland. The main indications for GA are young age, dental fear, medical condition or lack of co-operation.

Aim: Was to evaluate the characteristics of the child population treated.

Design: The data was collected from the dental files of the patients treated under GA during a six month period between 1st Jan 2009 and 30th Jun 2009. It included the medical and dental diagnoses, age, gender, and information of the origin of the child (a native of Finland or an immigrant).

Results: A total of 69 children were treated. The diseases or conditions of the children presented: syndromes (16 children), cancer (9), organ transplantation (2), developmentally disabled children (10), heart diseases (4), neurological diseases (7), metabolic or endocrinological disease (3), gastro-intestinal disease (1), and bleeding disorder (1). Of the patients 69% were boys. The mean age of the patients was 7.9 years (SD 3.6). The main dental diagnosis was dental caries. In addition, patients with hereditary dental diseases, MIH, trauma, and cysts were treated. 12% of the patients were of other than Finnish origin.

Conclusions: Diagnoses of children treated under GA in Children's Hospital presented a wide variety. Operating dentist should have a good knowledge of different diseases and conditions in order to offer the best possible dental care. Treatment plans of these patients are therefore often done with close collaboration with other pediatric specialties.

P10-167

Oral manifestations in patients with hypophosphatasia: report of 14 cases

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Background: Hypophosphatasia is a rare inherited disorder characterized by defective bone mineralization and deficiency of tissue non-specific alkaline phosphatase (TNSALP) activity. The Disease is caused by mutations in the liver/bone/kidney alkaline phosphatase gene (ALPL) encoding TNSALP. As for dental manifestations, premature loss of deciduous teeth due to disturbed cementum formation is well known. However, few reports investigated multiple cases.

Aim: The oral manifestations of patients diagnosed with hypophosphatasia were analyzed by collecting clinical records of cases from a nationwide survey of pediatric dentistry clinics affiliated with university dental hospitals in Japan.

Design: We inquired regarding the number of cases and clinical findings of diagnosed patients.

Results: We obtained information for eight children diagnosed with hypophosphatasia from our university and six from three other universities. The main oral manifestation was early exfoliation of deciduous teeth, which was found in 13 of the 14 cases. Early exfoliation of mandibular deciduous anterior teeth was recognized in 10 cases, whereas there were no cases of early exfoliation of a permanent tooth.

Conclusions: The main oral finding of hypophosphatasia was early exfoliation of deciduous teeth, predominantly in the mandibular anterior region at the age of 1-4 years-old.

P10-168

Total antioxidant capacity of saliva in children with cerebral palsy and down syndrome

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Background: Saliva has several protective components and has also been found to be rich in antioxidants, mainly uric acid. The imbalance in the levels of free radicals and reactive oxygen species with antioxidants may play an important role in the onset and development of several inflammatory oral pathologies.

Aim: This study aimed at estimating the Total Antioxidant Capacity, Nitric Oxide and Sialic Acid levels in saliva of children with cerebral palsy and Down's syndrome.

Design: Thirty children each, aged between 7 and 12 years with cerebral palsy and Down's syndrome were selected. Thirty normal children matched for age and gender were also selected for the purpose of comparison. Unstimulated saliva was collected from each child. The Total Antioxidant Capacity (TAC), Nitric Oxide (NO) and Sialic Acid (SA) levels were evaluated using Spectrophotometric Assay. Data obtained was statistically analyzed.

Results: The mean value of salivary TAC was 74.04 µg/mL, NO was 48.50 µg/mL and SA was 34.23 mg/dL in children with cerebral palsy. In children with Down's syndrome, the mean value of salivary TAC was 110.48 µg/mL, NO was 53.93 µg/mL and SA was 77.22 mg/dL. There was a significant difference in all the 3 levels between the two groups. ($P < 0.001$).

Conclusion: In comparison to normal children the TAC of saliva was found to be lower in children with cerebral palsy and Down's syndrome.

P10-169

Amelogenesis imperfecta-like presentation in a patient with type I diabetes and coeliac disease

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Introduction: Type I diabetes is a metabolic dysfunction characterised by hyperglycaemia resulting from deficiency in insulin secretion. Coeliac disease results from inflammation to the small intestinal mucosa due to gluten sensitivity. Both of these conditions are autoimmune disorders arising from a combination of genetic and environmental factors. The prevalence of coeliac disease in type I diabetics is reportedly much higher than in the general population.

Case report: A 13-year-old girl with poorly-controlled type I diabetes and coeliac disease was referred by her paediatrician to the Department of Paediatric Dentistry, Leeds Dental Institute for dental aesthetic concerns. She had no known familial history of medical or dental problems. Clinical and radiographic examination revealed caries and amelogenesis imperfecta-like defects affecting her permanent teeth requiring preventive and restorative treatment.

Medical management for every dental visit included pre- and post-operative blood glucose checks, with morning appointments scheduled and minimal disruption to her daily routine. Preventive measures included topical fluoride application and appropriate diet counseling suited to her dietary restrictions. Dental infections were treated more aggressively to prevent acute exacerbations.

Comments: Poor glycaemic control and late diagnosis of coeliac disease can contribute to the severity of enamel defects and mimic amelogenesis imperfecta (AI). However, the possibility that the patient's teeth could be affected by AI in addition to her diabetes and coeliac disease cannot be excluded. These conditions significantly affect the psychosocial aspects of the patient. The dental team plays an important role in ensuring that patients with such medical and dental conditions maintain a high quality of life.

P10-170

Oral health status, attitudes and behavior of non-institutionalized, working adults with intellectual disabilities

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Background: Adults with Intellectual Disabilities (ID) are widely considered at high risk of dental caries and periodontal diseases.

Aim: To investigate the oral health status, attitudes and behavior of working adults with ID.

Design: A sample of 62 non-institutionalized, working adults (20–46 year-olds) with ID was examined using the DMFT, DMFS, CPI, OHI-s indices. Socio-demographic and behavioral data as well as information on general health, were collected through interviews with the patients and their parents. Ethical Approval was obtained by the Occupation Centre of the adults prior to the start of the study. Parental consent was also required for the patients to participate.

Results: The mean DMFT and DMFS scores of the adults were 9.65 and 26.43, respectively. Younger patients and those from higher socioeconomic level had significantly lower DMFS values. Concerning periodontal health, 1.6% of the individuals had healthy periodontium, 39.3% bleeding on probing, 44.3% calculus, 11.5% shallow pockets and 3.3% deep pockets. Additionally, 66.1% had good oral hygiene status, 27.1% fair and 6.8% poor; 89.1% brushed their teeth daily, but they seldom used dental floss. Only 32.1% had ever received a professional fluoride treatment, while 50% and 27.3% consumed daily foods with high sugar content and soft drinks respectively. More than 50% of the parents reported that dentists were reluctant to provide care for ID individuals.

Conclusions: Adults with ID present less healthy periodontium and lower level of restorative care compared to their non-ID counterparts. Appropriate oral health care facilities and effective preventive programs should target this high risk population group.

P10-171

Study on the dental caries and related risk factors of intellectually/mentally disabled children in Guangzhou City

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Background: Intellectually/mentally disabled children are the majority of handicapped children in China. Parents and clinicians tend to focus on children's physical and psychological defects, while ignoring their oral health.

Objective: To survey the prevalence and characteristics of dental caries in intellectual/mental retarded children in Guangzhou city.

Methods: A total of 677 intellectually/mentally disabled children aged from 6 to 17 were selected in the survey of dental caries by the use of stratified cluster sampling method.

Results: Caries prevalence rate of all children was 54.1% and DMFT/dmft was 1.99, while the constituent ratio of F/f was just 2.0%. The caries prevalence rate and the DMFT of permanent teeth in the 12-year-old group was 45.6%, (1.09). The difference of caries prevalence rate and DMFT/dmft were significant ($P < 0.05$) both between schools and between sexes. Differences among different disability levels were not statistically significant ($P > 0.05$). Both caries prevalence rate and DMFT/dmft of children with multiple disabilities were higher than those of children with intellectual/mental disability only ($P < 0.05$).

Conclusions: Caries prevalence rate and DMFT/dmft of intellectually/mentally disabled children in special educational schools in Guangzhou were generally higher than those of healthy children, whereas the constituent ratio of F/f was comparatively lower. The institution and sex factors affected the caries prevalence heavily and the caries risk increased significantly when the children suffered from multiple disabilities.

P10-172

Sequence of permanent teeth emergence in children with malignanciesC. BICA¹, A. DRASOVEANU¹, M. PACURAR¹,
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Background: Untreated simple or complicated caries of primary teeth lead to anomalies in the order of emergence of permanent teeth. The assessment of the oral-dental status in children diagnosed with malignancies emphasized the high frequency of carious lesions in deciduous teeth.

Aim: To investigate the patterns of permanent tooth emergence in a group of children with malignancies compared to a group of healthy children and to ascertain the relationship between the malignant disease and the pattern of permanent tooth emergence.

Design: Children aged 9–11 with mixed dentition were included in the study: 58 healthy children and 36 with malignancies, who had undergone chemotherapy according to the specific protocol. The assessment of the emergence pattern of the permanent teeth was carried out through regular clinical and radiological medical examinations.

Results: The weight of the dmft index ≥ 5 was 46.55% in healthy children and 63.88% in children with malignancies. We noted optimal emergence sequences of permanent teeth on the maxilla in a ratio of 38% in healthy children and in a ratio of 25% in children with malignancies. On the mandible the weight of optimal sequences represented 41% of the total eruption patterns in healthy children and 31% in children with malignancies. No statistically significant associations were recorded between the emergence pattern and the malignant disease ($P > 0.05$).

Conclusions: Malignancy and chemotherapy do not significantly interfere with dental substitution. The high incidence of cavities in children with mixed dentition influences the emergence patterns both in healthy children and in those with malignancies.

P10-173

Guideline for oral health in children with special health care needs in MexicoH. MARTINEZ^{1,2,3}, R. MARTINEZ², M. A. G. TREVINO³ & G. RIVERA³¹School of Dentistry, University of Monterrey, Mexico;²Department of Dentistry and Stomatology, University ofMonterrey, Mexico; ³Tissue Engineering and Regenerative Medicine Laboratory, University of Monterrey, Mexico

Background: Stimulating an adequate comprehension of primary prevention and oral health regarding children with special health-care needs is an essential task in odontology, and specifically pediatric odontology.

Aim: Since these children require special dental care and well-adjusted diet at a very young age, they constitute a risk group. However, this group has not been receiving the precautionary measures it compels for a satisfactory oral health care in Mexico.

Design: This guideline is based on a review of the recent dental and medical literature to individuals with special health care needs. A Medline search was performed using the terms 'oral health', 'special needs', 'dentistry', 'disabled patients', and 'handicapped patients'.

Results: With this first guideline established in Mexico, pediatricians and odontologists must be able to provide the best level of attention for every patient and assure the special health precautions to those who need them.

Conclusions: This study establishes precepts involving oral health in specially-abled infants.

P10-174

Caries experience of 2–3 year-old children with cleft lip and palate in Riga cleft lip and palate centre

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Background: The estimated incidence of clefts in Latvia is around 1.4 per 1000 live births. The incidence of caries negatively affects children with clefts because the success of the oral rehabilitation is related to adequate oral health.

Aim: To evaluate caries experience of 2–3 year-old children with clefts treated in Riga Cleft Centre.

Design: From April 2009 till December 2010 caries experience was evaluated in 59 children aged 2–3 years attending consultations in cleft centre. Control group consisted of 62 healthy children. Children were examined under standart conditions of seating and lighting. Data was registered in clinical evaluation forms. Experience of caries was evaluated with dmft(t) index for decayed, missing and filled teeth and dmfs(s) for surfaces. Indices were used according to the WHO criteria (1997).

Results: In the cleft group, 58% of the children were affected by caries, with the mean dmft(t) 3.73 ($d = 3.49$; $f = 0.24$), dmfs(s) 7.24 ($d = 6.98$; $f = 0.26$) compared with 30% for the control group (mean dmft(t) 1.53 ($d = 1.37$; $f = 0.16$), dmfs(s) 2.44 ($d = 2.23$; $f = 0.21$). The most frequently affected teeth, according to the dmft(t) index, were central incisors and first molars in both groups.

Conclusions: Children in Riga, Latvia with clefts are considered as a group having an increased risk of caries. It is necessary to develop preventive programs for children with cleft lip and palate according to their needs.

P10-175

Dental management for leukemic patients

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Background: Acute leukemia usually presents precipitously with bone marrow failure and associated anemia, infection, and bleeding. Breakdown of mucosal barriers leads to the development of systemic infections. Infections and anemia are the major causes of death in leukemic patients.

Aim: To review the literature on dental management for leukemic patients.

Design: A research was performed using the keywords 'Dental management' and 'leukemia' to identify the current literature. The related articles were searched in databases including IDL, Pubmed and Medline from 2004 to 2010.

Results: When leukemia is suspected, conservative care (e.g. giving antibiotics and analgesics as indicated) should be given rather than aggressive surgical intervention. Dental procedures that could trigger a bleeding or bacteraemia should be avoided. Endodontic treatment of primary teeth should be avoided while in permanent teeth its performance is controversial (due to developing into a

source of significant systemic infection). Accordingly, teeth with poor/questionable prognosis should be extracted and this should be performed at least 10–14 days before the commencement of chemotherapy. The aspects that should be considered are: perform thorough dental examination with panoramic and bite-wing radiographies, restore all carious lesions, brush teeth with fluoride paste twice daily, use chlorhexidine mouthwash twice daily, temporarily refrain from tooth-brushing if oral lesions are too painful, prescribe nystatin oral suspension four times daily (if there are signs of oral candidiasis), or topical acyclovir (if there are signs of herpes simplex infection) and recall at 1–6 months intervals. To minimize the risk of development of radiation caries, oral hygiene must be optimal and include good home-care and regular dental visits.

Conclusions: Pretreatment dental care aims to prevent oral complications during chemotherapy. Dental care during remission should focus on maintaining the dental health of the affected patients. As infection during neutropenia is the most common cause of death in oncology patients and all efforts should be made to minimize this risk.

P10-176

Long term effects of chemotherapy in developing dentition: presentation of seven different cases

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Introduction: Chemotherapy although have improved survival in childhood cancer, has also many injurious effects on developing teeth. Disturbances in dental development have been reported in long-term survivors with malignant diseases, who were treated with chemotherapy. Dental abnormalities such as enamel defects, altered root development, microdontia and tooth agenesis have been reported in the literature.

Case report: Seven different cases of children between ages 7 and 17 years-old, diagnosed with malignant disease are presented. The patients had received chemotherapy at ages varying from 5 months to 9 years-old. Disturbances in dental development such as microdontia, short and thin roots, complete root agenesis and tooth agenesis were found in all seven cases. The type and the severity of these aberrations depended on the child's age at diagnosis, doses and schedules of treatment. Dental development in these children is compared with the normal development of their peers at the same age.

Comments: The presented cases illustrate the clinical effect of chemotherapy on the developing dentition. The time of oncology treatment results in different time attacks on proliferating cells with varying results on the formation of permanent teeth and their roots. Knowledge of the stage of dental development at the time of oncology treatment and the type of therapy allows the clinician to predict dental effects of the chemotherapy that in turn may affect future dental care.

P10-177

Interdisciplinary dental management of an adolescent male putatively due to vitamin D deficiency in early lifeJ. W. WONG¹ & D. J. MANTON²¹Private practice, Perth, Western Australia; ²Melbourne Dental School, University of Melbourne, Vict., Australia

Introduction: With the changing patterns of immigrant populations into Australia, conditions not normally seen in this country are becoming more prevalent. Vitamin D and its metabolites, via the transcription of genes and gene expression of proteins, play an important role in calcium and phosphate homeostasis including the formation of mineralised tissues. Deficiencies in vitamin D are associated with multiple medical complications including oral and dental manifestations.

Case report: A 13 year-old male with an Ethiopian background and a history of unknown vitamin deficiencies presented with multiple clinical signs consistent with a vitamin D deficiency in early life. Clinical, radiographic and histological examination revealed chronological hypoplastic defects of enamel, an infraoccluded primary tooth with an associated dentigerous cyst and impacted premolar, taurodontic permanent molars, upper and lower dental crowding and a unilateral posterior cross-bite. Initial aesthetic management was conservative with adhesive restorations successful in achieving an improvement in aesthetics to the patient's satisfaction. Further comprehensive interdisciplinary management including oral surgical and orthodontic interventions has been undertaken, reducing the risk of pathological changes and the need for future complex prosthodontic treatment. The subject is currently undergoing full-fixed orthodontic treatment as part of his ongoing care.

Comments: Although impossible to determine the origin of the multiple oral anomalies in the subject, the pattern of findings are consistent with a severe vitamin D deficiency in early life. Due to a relatively late presentation, more complex management has been required than if an earlier attendance occurred.

P10-178

Knowledge among parents of patients with congenital heart anomalies about the importance of oral healthA. REXHEPI¹, A. RAKA¹, T. KUTLLOVCI¹, A. BEGZATI¹, B. XHEMAJLI¹ & V. KRASNIQI²¹Dentistry School, Department of Pediatric and Preventive Dentistry, University Clinic of Prishtina, Kosovo; ²Dentistry School, Department Of Oral and Maxillofacial Surgery, University Clinic of Prishtina, Kosovo

Background: The congenital heart anomalies are considered to be a risk factor for the development of bacterial endocarditis from the oral diseases and dental treatment. The oral health care has an important role for the general health protection of these patients.

Aim: The aim of this study is to evaluate the knowledge of parents of the patients for link between the congenital heart diseases and oral health care and dental intervention.

Material and method: This study includes 80 children with congenital heart anomalies, with different types of anomalies, age 3–15 years, from different parts of Kosovo. The special questionnaires that were used, included: the knowledge of importance of oral health, the source of information for the impact of dental treatment in their general health and how often the children take care about their teeth.

Results: About 68.8% of patients or their parents were informed for the risk during the dental interventions, but they had no knowledge about the importance of oral health care. A total of 91% were informed by their pediatrician while only 9% were informed by dentists. Only 7.5% of children brush their teeth twice a day, while 42.5% rarely or never.

Conclusion: Results show that these patients must be informed how to take care their oral health. The reason for this is to avoid dental interventions, which can risk the development of bacterial endocarditis.

P10-179

Dentofacial injuries in children and their relationship with psychiatric symptoms of externalizing typeI. VASILOUDIS¹, M. SIFAKAKI¹, G. VADIAKAS¹, G. KOLAITIS² & L. PAPAGIANNOULIS¹¹Department Paediatric Dentistry, Dental School, University of Athens, Greece; ²Paediatric Psychiatry Clinic, School of Medicine, University of Athens, "Aghia Sophia" Children's Hospital, Greece

Background: Children with psychiatric externalizing disorders present with signs and symptoms commonly related with pathological behaviors that potentially constitute predisposing factors for injuries.

Aim: To assess whether psychiatric externalizing disorders including conduct disorders and a short attention deficit span/hyperactivity are related with an increased probability for dentofacial injuries.

Design: The study sample was selected among children/adolescents of school age that showed up for treatment, at the postgraduate pediatric dental clinic, University of Athens. The study group included 82 subjects with a history of dentofacial injuries and the control group 82 subjects without a history of dental trauma. Two questionnaires were completed after interviewing parents, the first searching for general psychiatric externalizing disorders (SDQ) and the second for attention-deficit/hyperactivity disorder (ADHD). A detailed dental trauma record was completed for each patient.

Results: No significant difference between the two groups was found regarding the five variables indicative of general psychiatric externalizing disorders such as prosocial behavior, hyperactivity, emotional symptoms, conduct and peer problems ($P = 0.111$). The ADHD test for questions concerning attention-deficit/hyperactivity symptoms also found no significant difference in prevalence ($P = 0.490$).

Conclusions: Greek children/adolescents with a history of a dentofacial injury did not show an increased prevalence in symptoms of externalizing psychiatric disorders, when they were compared to children with no oral injury.

Poster Session P11/Oral Medicine and Pathology

P11-180

Hyperbaric oxygen use in a 7 year-old child requiring dental extractions

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Introduction: Rhabdomyosarcoma is one of the common sarcomas of myogenic origin seen in the paediatric population. It mainly involves the head and neck region and is usually treated with radiotherapy and chemotherapy. Providing dental treatment can be challenging due to the side-effects of the treatment.

Case report: A 7 year-old patient was referred to Leeds Dental Institute from the Paediatric Oncologist to be seen for oral assessment after mother's concerns about the patient's teeth. She had been diagnosed with Left Parotid Parameningeal Alveolar Rhabdomyosarcoma and treated with a combination of chemotherapy and radical radiation. Radiotherapy included 36 Gy bilaterally and 50Gy as a boost to the left parotid region. Both treatment modalities were completed 2 years before the time of referral. She was not on any maintenance therapy. Thorough oral assessment revealed left 7th cranial nerve palsy, generalised gingival inflammation, interproximal caries in lower permanent incisors, extensive caries on posterior primary molars and atypical carious lesions on the incisal tips of all primary canines. Intensive preventive advice included the use of occlusal splints for chlorhexidine and fluoride gels. On the advice of her Clinical Oncologist, she underwent hyperbaric oxygen therapy 20 sessions over a 4 week period pre-operatively and 10 sessions over 2 weeks post-operatively. Comprehensive dental treatment carried out under general anaesthesia involved restorations, fissure sealants and extractions of primary teeth with poor prognosis.

Comments: Careful peri-operative planning is essential for pediatric oncology patients who are at more risk of dental and oral complications.

P11-181

Oral manifestations of leukemia

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Background: Initial signs and symptoms of leukemia can appear in the mouth or neck. These oral presentations may lead the patient to seek dental care, or they may be noticed during a routine dental examination. Oral lesions are more commonly found in patients with AML.

Aim: To review articles related to oral features and leukemia.

Design: The related articles were searched in databases including IDL, Pubmed and Medline from 2004 to 2010, using the keywords 'oral features' and 'leukemia'.

Results: Typical oral manifestations of AML include gingival swelling (usually the first sign), oral ulceration (as a result of infection by normal oral flora in the setting of neutropenia) spontaneous gingival bleeding and petechiae, mucosal pallor,

atrophic glossitis, herpetic infections and candidiasis due to thrombocytopenia. Symptoms are fever, fatigue, anorexia, weight loss, lymphadenopathy, laryngeal pain and generally flu-like with bone pain, joint pain, or both. More atypical oral findings that have been reported include cracked lips and the presence of hemorrhagic bullae on the anterior dorsum of the tongue, buccal and labial mucosa, toothache and tooth mobility. ANUG typically presents with 'punched-out' ulceration involving the interdental papillae which are covered by a pseudomembrane. After a successful chemotherapy, gingival hyperplasia usually recedes together with the remission of the disease. Gingival overgrowth due to blood dyscrasias are edematous, soft, tender to touch and show tendency to bleed. A dental therapy driven without hematological consultation could be fatal.

Conclusions: The fact that gingival hyperplasia is sometimes the first manifestation of the leukemia implies that dental professionals must be sufficiently familiarized with the clinical manifestations of this systemic diseases.

P11-182

Levels of volatile hydrogen sulfide concentration and the analysis of related factors in oral cavities of 3–5 years-old healthy children

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Background: Halitosis among children and adolescents is increasing. Children problems of bad breath are a concern by most parents.

Aim: To investigate the levels of volatile H₂S in oral cavities of 3–5 years-old health children and to analyze the related factors of oral malodor in health children.

Design: The levels of volatile H₂S in oral cavities were evaluated in a sample of 340 health children aged 3–5 years-old. Oral malodor was measured with both organoleptic measurements and a portable volatile hydrogen sulfide monitor. Assessment of oral clinical status was included, Pearson's correlation was used to determine the relationship between organoleptic score (OS), the levels of volatile H₂S and other clinical evaluations. Bivariate logistic regression analysis was performed to detect the degree of association between oral malodor and various dental parameters. Odd ratios of oral malodor-related factors were calculated.

Results: The mean level of volatile H₂S in oral cavities of 3–5 years-old healthy children was 46.72 ± 23.27 ppb. Significant correlations were found between OS and levels of H₂S. Tongue coating score and simplified oral hygiene index –were significantly associated with OS and had the highest odds ratio value based on the logistic regression analysis.

Conclusions: It is suggested that oral malodor is related with oral parameters in healthy children.

P11-183

Double eruption cyst in a newborn boy. Report of an unusual case and review of the literatureM. ZARAKAS¹, K. TSINIDOU², C. TRIANTAFYLLOU¹, E. MEGALOGIANNI² & K. TOSIOS¹¹Department of Oral Pathology and Surgery, Dental School, University of Athens, Athens, Greece; ²Private practice, Greece

Introduction: Eruption cyst is a developmental anomaly, clinically manifesting as a swelling of the alveolar ridge mucosa, shortly before the eruption of the associated tooth. It is rare in newborns and usually appears as an isolated lesion; however, multiple occurrences have occasionally been reported. It usually presents with red-blue coloring, being soft and compressible on palpation. Although the majority of eruption cysts are asymptomatic, pain on palpation due to trauma or infection may be present.

Case report: We present a case of a double eruption cyst in a newborn boy associated with the deciduous mandibular central incisors. It presented as a bluish bilobular tumor, necessitating differential diagnosis from melanoticneuroectodermal tumor and hemangioma. Based on the radiographic findings, it was decided to follow the lesion till the eruption of the involved teeth that ensued a month later, leading to its disappearance.

Comments: The bilobular presence of the eruption cyst combined with the very young age of the patient make this case highly unusual. Clinical differential diagnosis included congenital epulis, melanoticneuroectodermal tumor, gingival cyst (Epstein pearl, Bohn's nodule), and hemangioma. However, tooth eruption pattern and timing, and lack of significant findings on radiographs confirmed the diagnosis of eruption cyst.

P11-184

Tooth extraction in child patients with haemophilia – comparison of two possibilities of treatment

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Introduction: The blood is in a dynamic equilibrium between fluidity and coagulation, but the haemostatic mechanism is more complex than just alterations in this equilibrium. Haemophilia A is an X-linked, recessively inherited condition caused by factor VIII deficiency. Haemophilia B has factor IX deficiency.

Case report: Extraction of tooth in moderate and severe haemophiliacs is risky treatment without cooperation with Department of Paediatric Hematology and Oncology. Hematologist has to prepare patients with haemophilia A or haemophilia B before planned extraction of tooth – substitution missing coagulative factors (F VIII, F IX). After hematological preparation we compared two possibilities of treatment after extraction: classical method of treatment by using tissue glue Tissucol applicated into wound, stitch up wound, second application Tissucol (based on factor coagulation XIII and thrombin) on stitch and fixation of cover plate by zinc oxide-eugenol past Repin and second method by using Floseal Hemostatic Matrix (based on gelatin matrix and thrombin components) without using cover plate. We used and compared both methods of treatment and method by using Floseal Hemostatic Matrix is for us and patients better because preparation is easier and patients feel more comfortable without using cover plate.

Comments: Haemophiliacs are specific group of patients and we want to avoid extraction of teeth. The prevention is most important especially for haemophiliacs. This research has been supported by the Grant Agency of the Ministry of Health of the Czech Republic No. 9991-4.

P11-185

An *in-vitro* observation of five traditional chinese medicine extractions' inhibitory effect on halitosis bacteria

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Background: Halitosis among children and adolescents is increasing. Ninety percent of halitosis is caused by anaerobic bacteria. Chemical medicines have too much side effects and taste bad. Traditional Chinese medicine may have its predominance.

Aim: To observe the inhibitory effect of five Traditional Chinese herbs extractions on two kinds of halitosis-associated bacteria, *Porphyromonas gingivalis* (Pg) and *Fusobacterium nucleatum* (Fn).

Design: Five Traditional Chinese herbs with antibacterial or detoxifying effect were extracted by water and each was double diluted into eleven concentrations. The cup-plate method was used in order to investigate the anti-bacterial activity of the extracts on Pg and Fn, and to find out the minimum inhibitory concentration (MIC) of each herb.

Results: The extractions of coptis, gallnut and scutellaria afforded the first three inhibition rings both on Pg and Fn. The extraction of honeysuckle showed minimum effect on Fn, while as to Pg, magnoliae officinalis is the weakest. The MICs of coptis, gallnut, scutellaria, honeysuckle and magnoliae officinalis for Pg are 0.048, 0.3906, 0.0488, 12.5, and 25 mg/mL respectively. Their MICs for Fn are 0.0977, 0.3906, 0.3906, 100, 6 mg/mL respectively.

Conclusions: Coptis, gallnut, scutellaria honeysuckle and magnoliae officinalis all have anti-bacterial action. Among them coptis, gallnut, scutellaria are the most outstanding.

P11-186

Malignant salivary gland neoplasms: analysis of five new pediatric cases

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Aim: Neoplasms arising from minor salivary glands in children younger than 19 years of age are rare and little is known about their biologic behavior. The objective of this study was to investigate the incidence, clinical features and biologic behavior of malignant minor salivary gland tumors of epithelial origin in children ≤19 year.

Design: Cases of malignant minor salivary gland neoplasms in children ≤19 year, from the archives of Oral and Maxillofacial Pathology at LSUHSC School of Dentistry were reviewed and selected for this study. Review of the literature was done to select reported cases. Data from both sources was combined to study the clinical features and biologic behavior.

Results: The incidence of benign and malignant minor salivary gland neoplasms in the first two decades was 3.5%, with 35.7% of the lesions being benign. Mucoepidermoid carcinoma (MEC) was the most commonly occurring malignant neoplasm. The mean age of patients with MEC was 13.6 years with a 5:1 predilection for white children, and 1.8:1 predilection for females. The palate was the most common site of occurrence (85%). The recurrence rate of MEC was 7%.

Conclusions: Benign and malignant lesions from minor salivary glands ought to be considered in the differential diagnoses of lesions in the oral cavity of children. MEC arising from the minor salivary glands in children appears to have a high recurrence rate (7%).

P11-187

Tooth decay prevalence and DMF index in HIV/ children undergoing highly active antiretroviral therapy including NNRTI

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Background: It has been reported that adult patients with HIV + / AIDS undergoing Highly Active Antiretroviral Therapy (HAART) including No-Nucleoside Reverse Transcriptase Inhibitors (NNRTI) have better oral health than HIV + / AIDS patients undergoing HAART including protease inhibitors. However it has not been yet documented, if the HIV + / AIDS children show similar response.

Aim: To establish tooth decay prevalence, DMF index and prevalence of gingivitis in HIV/AIDS children undergoing HAART including NNRTI and to compare it with patients undergoing antiretroviral therapy including protease inhibitor (HAART/PI).

Design: Thirty HIV + / AIDS children 3–13 years-old (7.7 ± 3.6) perinatally infected under antiretroviral treatment for at least 6 months at General Hospital, Tijuana, Mexico were included. Two groups were formed: 16 children receiving HAART including NNRTI and 14 patients under HAART including protease inhibitors. Children were clinically record the DMF index according to the WHO criteria Chi square test was applied ($P < 0.05$ IC 95%).

Results: Caries prevalence in the entire sample was 73.3% while the DMF Index was 4.07. 60% of the children had gingivitis. Tooth decay prevalence and DMF index were not associated to gender or immunological and virological status. However, in respect to antiretroviral therapy, the children undergoing HAART including NNRTI had lower DMF index (1.6) than the children undergoing HAART including protease inhibitors (DMF = 5.7) ($P 0.005$).

Conclusions: HIV/AIDS children undergoing HAART including NNRTI presented better dental health than patients under HAART including protease inhibitors.

P11-188

Exudative erythema multiforme (MKB CODE C-3).

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Introduction: Exudative erythema multiforme (EEM) is an acute disease with polymorphic eruptions on the skin and mucous tunics (one of the possible reasons for it is medications).

Case report: A boy of 11 years-old was prescribed to take Flemonine to treat bronchitis that was resulted in erosions covered with fibrin stains in the oral cavity and polymorphic eruptions on the skin the next day after taking the medication. One day later there were bubbles of various sizes in the oral cavity. The red border of the lips was crusted severely. The complex treatment course included desintoxicative, desensitizing and antibacterial therapy. The local treatment course consisted of anesthesia, helium-neon laser and the nonsteroid anti-inflammatory medication TANTUM VERDE. The boy was fully recovered on the 14-th day of illness.

Comments: The adequate therapy enabled to make the recovery fast.

P11-189

Osteopetrosis: a comprehensive report of a rare case

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Introduction: Osteopetrosis is a rare genetic disease which is transferred as an autosomal recessive gene; in this disease bone density will be increased due to malfunction of osteoclast cells in natural bone absorption whereby the bones harden and becoming denser. The aim of this study is to present a rare case of a child with osteopetrosis from the beginning until the end of his life, in order to guide dentists and specialists to apply accurate diagnosis and careful treatment planning for these patients.

Case report: In 1981, a 14-year-old boy was referred by his family physician to the Pediatric Dental Clinic of Mashhad Dental School due to dental problems such as severe delay in deciduous and permanent teeth as well as dental malformation. The definite diagnosis was benign adult form of osteopetrosis. The maxillary primary molar teeth were treated with stainless steel crowns until the age of 23-years-old. One of his primary molars was extracted and an appropriate antibiotic was prescribed for him. No infection including osteomyelitis was observed at the patient's jaws. At the age of 23-year-old, the patient was referred to an oral surgeon. Subsequent to extracting some deciduous teeth, symptoms of osteomyelitis were observed at the operated region. Despite the antibiotic coverage, the patient's jaw infection was never cured even until the age of 35. Important thing in his life was his normal IQ and he required no blood transfusions.

Comments: Dentists should consider these patients as high risk patients and should seriously avoid unnecessary and wide range dental surgeries to avoid the secondary complications of the disease such as fractures and osteomyelitis.

P11-190

Regional odontodysplasia: integral management

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Introduction: Regional Odontodysplasia (OR), also known as 'ghost teeth'; or odontogenic dysplasia, is a nonhereditary dental abnormality characterized by alteration during tooth development, which affects the ectodermal and mesodermal component of the teeth. The condition in most cases affects only one quadrant.

Case report: The aim of this work was to present a preventive and integral treatment, in order to fix the mastication, phonetics, aesthetics and occlusion functions; keeping the growth and development of the jaws. A 10 years-old female patient was referred to the Pediatric Dentistry Department of the University of Buenos Aires, due to the absence of eruption of permanent teeth. Clinically showed only one tooth in right maxillary quadrant. Radiographically, the germs of the permanent central, canine, first and second premolar and first molar showed dental development failure, with enamel and dentin layers very thin, wide pulp chambers and immature roots. Multidisciplinary treatment was performed. A removable acrylic partial denture was installed. The patient was referred to oral myofunctional therapist for speech therapy, mastication and swallowing; and to psychologist, to improve acceptance of prosthetic appliances. Regarding dental development the patient remains under follow-up for radiographic monitoring of the affected teeth.

Comments: It is necessary that the pediatric dentist makes earlier diagnosis of dental anomalies, know the possible outcome and implement a multidisciplinary approach, in order to perform the planning and execution of definitive treatment, as needed.

P11-191

Co-existence of an hybrid calcifying cystic odontogenic tumour and a cutaneous pilomatrixoma in a child: case report and literature review

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Introduction: Calcifying cystic odontogenic tumour (CCOT) is a benign cystic neoplasm of odontogenic origin, characterized by ameloblastoma-like epithelium with ghost cells. Nevertheless, ghost cell tumours may be present alongside with various other odontogenic cysts and tumours. Hybrid odontogenic tumours displaying two or more histopathologic patterns are rare lesions. To present a case report of a hybrid odontogenic tumour with histopathologic features of CCOT presenting alongside a cutaneous pilomatrixoma and to review the literature concerning hybrid odontogenic lesions.

Case report: An 11 years-old boy presented with a large well-defined unilocular radiolucent lesion with focal marked radiopacity in the right posterior mandible. Marsupialization of the lesion was decided because of the size of the lesion and the possible injury of the inferior alveolar nerve. The histopathologic analysis of the incisional biopsy was consistent with a hybrid odontogenic tumour involving areas identical to CCOT, ameloblastoma, ameloblastic fibro-odontoma, ameloblastic fibromyxoma and adenoid odontogenic tumour. After 7 months, the remaining lesion was enucleated. A cutaneous tumour was also removed from the facial area with a histologic diagnosis of pilomatrixoma. No medical problems or signs of recurrences were noted after a 24 months period.

Comments: Fifteen cases of CCOT associated with odontogenic tumours other than ameloblastomas and odontomas have been presented up to date. They commonly affect young males and involve the posterior mandible. Their treatment is usually enucleation. The present case is the first one where a ghost cell odontogenic tumour presents alongside with a pilomatrixoma.

P11-192

Transient lingual papillitis in a paediatric patient: case report and literature review

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Introduction: Transient Lingual Papillitis (TLP) is a relatively common, but not well documented, condition that involves a variable number of lingual fungiform papillae. The purpose of this paper is to review the literature concerning pathogenesis, clinical signs and treatment of TLP, as well as to present the salient features of a case in a pediatric patient.

Case report: A 4 years-old girl was referred to the clinic of Oral Pathology and Medicine of the Dental School, University of Athens, Greece because of periodical painful symptoms on the dorsal surface of the tongue of 2 months duration. After careful clinical and laboratory investigation, the diagnosis of TLP was made and the condition was treated by topical corticosteroids. The patient was advised to reduce any local irritation. Recalls 1 week and 3 months later revealed significant clinical improvement.

Comments: TLP is considered a common disease but only a small number of well documented case reports have been published. These cases can be categorized into three groups: (i) localized involvement, (ii) generalized involvement, (iii) generalized involvement with parakeratosis of the involved papillae. Pathogenesis is unknown but many triggering agents have been identified. The diagnosis is primarily based on the clinical signs. Treatment involves identifying and eliminating the triggering agents, as well as the use of topical corticosteroids. Informing and reassuring the patient regarding the benign nature of the condition is also necessary.

P11-193

Keratocystic odontogenic tumors in children. Eleven years experience

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Background: In 2005, the WHO Working Group classified odontogenic keratocyst as a tumor and recommended the term keratocystic odontogenic tumor (KCOT), distinguishing the lesion from the orthokeratinizing variant, which is now considered as an odontogenic cyst. Keratocystic odontogenic tumor is characterized as a benign intraosseous neoplasm of odontogenic origin with high recurrence rates.

Aim: To present the clinicopathological features and treatment of seven cases of KCOTs encountered over a period of 11 years at the Children's Hospital 'P. and A. Kyriakou'.

Design: The present study used clinical records, radiographs and oral photographs of KCOTs of the jaws in seven young patients aged 7–14 years, treated during an eleven years period (2000–2010). All KCOTs were surgically removed within healthy margins under general anesthesia. Removed tissues were examined histologically. Follow-up period ranged from 6 months to 10 years.

Results: There were three lesions in the posterior mandible, one in the anterior mandible, two in the posterior maxilla and one in the anterior maxilla. Treatment consisted of enucleation and curettage for six of the lesions, and marsupialization for one. The postoperative course in all cases was uneventful. Overall, the recurrence rate was approximately 14.3% (one case out of seven).

Conclusions: The aggressive nature of KCOT requires an aggressive treatment strategy, and its recent classification by WHO as a neoplasm should further motivate clinicians in this direction. Due to the aggressive nature and possibility of recurrence many years after initial treatment, long term follow-up is mandatory.

P11-194

Congenital epulis of the newborn – report of three cases

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Introduction: Congenital epulis (CE) or congenital granular cell tumor or Neumann's tumor is a rare benign lesion of the oral cavity. It is found exclusively in newborns soon after birth. The tumor has a site predilection for the anterior maxillary alveolar process and a distinct predilection for females. At the typical clinical presentation the tumor might be sessile or pedunculated, sometimes lobular, smooth, with normal or slightly reddish colour, varying in size from some millimeters to a few centimeters in

diameter. Usually it is presented as a single lesion, however occasionally multiple tumors have been reported in different places in the mouth. Surgical excision under general or local anesthesia is the treatment of choice. Cases of spontaneous regression in small tumors have been reported. The histogenesis of congenital epulis still remains controversial and inconclusive and there are several theories on the origin of the tumor. Early detection of congenital epulis can be made either soon after birth or prenatal by ultrasound and magnetic resonance imaging (MRI) examinations in cases of large lesions.

Case report: We report three cases of congenital epulis in newborn females. The diagnosis was based on clinical, histological and immunohistochemical findings. All three cases were managed with surgical excision within the first antenatal month.

Comments: Congenital epulis is a benign lesion of newborns with only about 200 reports in the literature. We report three more cases which may help understand the growth and the progress of this neoplasm.

P11-195

Follicular cyst in the childhood – case report

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Introduction: Osteolytic processes in the jaw bones are relatively common and could be caused by various diseases. The most common are different cysts especially in the childhood. In all cases, early diagnosis and treatment is important. Essential is x-ray imaging and CT.

Case report: Ten-years-old patient was investigated for swelling in the right perimandibular region. The hard tissue chamber was observed by intraoral palpation and extraoral inspection. Behind tooth 46 was found periodontal pocket with purulent content. Orthopantomogram confirmed a cystic cavity. The early diagnosis was – inflammatory follicular cyst. The surgical revision of the right part of mandible was performed with extension from developing tooth 48 to right foramen mentale. The cystic tissue was directly connected with roots of teeth 46, 85 while the whole process resulted from tooth 47. Lingual surface of the mandible was attenuated and vestibular surface was changed with the bone apposition. The whole vessel and nerve in the mandible was preserved during cyst extirpation (cyst body 40 × 25 × 30 mm). Extirpation was completed by extraction of teeth 46, 84, 85 and dystrophic 47. Incurred defect in the bone was restored by a bone graft from the huckle-bone and was finished by a final suture. The diagnosis was histologically confirmed.

Comments: According to the asymptomatic development the diagnosis is not often accomplished soon. That's why it is necessary to provide early diagnosis and preventive panoramic x-ray. The most frequent prevalence of the follicular cysts in childhood is between 10 and 16 years.

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P11-196

Amelogenesis imperfecta – long term rehabilitation in children

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Introduction: Amelogenesis imperfecta (AI) is a serious developmental defect of the enamel with a heterogeneous etiology and a wide variety of symptoms that affect both primary and permanent teeth. Patients with AI have unaesthetic teeth, more sensitive and mainly less functioning, primarily or secondarily decreased occlusal vertical dimension, etc. The aim of this report is to discuss the possibilities of a prosthetic treatment of the erupting teeth in the severe forms of AI.

Case report: Permanent posterior teeth are often treated with Ni – Cr crowns, anterior teeth with carboxylate temporary crowns. Mechanical properties of plastic crowns are insufficient for long term use. Metal crowns for lateral areas are much more stronger, but modern long – term solutions require more aesthetic, metal – free restorations for minimal risk of possible sensitization or allergic reaction. The case report describes the step by step prosthetic rehabilitation, in the treatment of AI using the Y-TZP zirconia ceramic for young erupted teeth.

Comments: This case report discuss the use of glazed zirconia copings fixed by glass ionomer cement for a temporary rehabilitation in a child patient with a hypoplastic type of AI in the period of mixed dentition. This treatment is mechanically resistant, restores the decrease of vertical dimension and is acceptable from the biological and aesthetic point of view.

P11-197

Giant cell fibroma in a child: case report

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Introduction: Giant cell fibroma is a fibrous tumor with distinctive clinicopathologic features. Unlike traumatic fibroma, it does not appear to be associated with chronic irritation. Giant cell fibroma represents approximately 2–5% of all oral fibrous specimens submitted for biopsy. Giant cell fibroma is typically an asymptomatic sessile or pedunculated nodule, usually <1 cm in size. Compared with common irritation fibroma, the lesion usually occurs at a younger age. Approximately 50% of all cases occur on the gingiva.

Case report: An 8-year-old boy visited SNUDH with an asymptomatic nodule on mesial alveolar crest of tooth no. 73. The lesion was 0.4 × 0.4 × 0.4 mm in size, sessile shaped and white-pink colored. No ulceration was found on the surface. An excisional biopsy was performed with electrosurgery kit. The diagnosis of the biopsy was giant cell fibroma. After 2 weeks of surgical removal, eruption of tooth no. 32 was observed. After 6 months of biopsy, no recurrence was found.

Comments: Generally, giant cell fibroma is treated by a conservative surgical excision. Recurrence is rare. Giant cell fibroma does not diminish naturally because excessive collagen is formed in the lesion and lasts permanently. If the lesion interferes with eruption of teeth, it should be removed quickly.

Poster Session P12/Morita Prize 1- Case Report - Dental Anomalies- Dental Trauma 2- Others

P12-198

Non-syndromic oligodontia in a 5-year-old child

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Introduction: Literature is replete with a multitude of dental developmental anomalies. Oligodontia and/or hypodontia are terms used interchangeably to describe the congenital absence of one or more teeth and is usually associated with medical syndromes. Prevalence of hypodontia in the permanent dentition is reported to range from 2.3% to 11.3%. Most studies reveal the absence of the third molars to be most common, followed by the absence of the mandibular second premolars. Maxillary lateral incisors are next in the hierarchy of commonly missing teeth. However, the absence of maxillary central incisors and canines is quite exceptional.

Case report: This report documents a case of a young boy presenting with congenitally missing maxillary and mandibular anterior teeth, including the canines. A thorough medical evaluation revealed no associated congenital anomalies or syndromes. Born of non-consanguineous parentage, there was no significant family history. There was also no history of intra-uterine infections or exposure to drugs.

Comments: This is a rare case as the literature reveals little information regarding the congenital absence of all permanent anterior teeth. Possible etiologies for this condition as well as the need for multi-disciplinary management are presented.

P12-199

Clinical management of supernumerary teeth: a report of a case

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Introduction: Supernumerary teeth are described as the teeth formed in excess of the normal dental formula. They have been reported in both the primary and the permanent dentition. Eruption of supernumerary teeth often causes crowding. A supernumerary lateral incisor may increase the crowding potential and may cause an aesthetic problem in the upper anterior region. In this case report, diagnosis and treatment approaches of a patient with one supernumerary teeth in maxilla is presented.

Case report: An 11-year-old male presented with a chief complaint of an extra front tooth. Medical and family histories were not contributory. Examination revealed a mild Class II molar relationship in the mixed dentition with a well aligned lower arch and increased overbite and overjet. A supplemental lateral incisor on left side of the maxillary arch was evident. Treatment involved extraction of the supernumerary lateral incisor and placement of

bands on the first upper and lower molars as well as brackets on incisors to correct malocclusion caused by the excess tooth substance. This mixed dentition treatment was successful and the patient is now under regular follow-up regarding fixed orthodontic treatment provided in the future.

Comments: Supernumerary teeth may erupt normally or remain impacted, but in either case their presence may lead to clinical problems. Most problems associated with supernumeraries are because of their potential to interfere with normal occlusal development or with orthodontic mechanics such as crowding, separation, impaction, or delayed eruption of permanent teeth, malocclusion, rotations, retained deciduous teeth, palatally displaced permanent canines, abnormal eruption sequence, and compromised space closure. In our case supernumerary teeth caused malocclusion of permanent teeth as described above. Whenever supernumerary teeth are diagnosed, single or multiple, a decision regarding the appropriate management should be made carefully. Surgical removal of the teeth may cause damage to adjacent teeth. Therefore, the interdisciplinary approach for the treatment is necessary.

P12-200

Mesiodens as a cause of midline space (a case report)

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Introduction: Supernumerary teeth are relatively common in the oral cavity and are characterized by an excessive number of teeth. The term 'mesiodens' refers to a supernumerary tooth located in the midline of the maxilla between the central incisors. This case report describes the treatment of midline space because of the presence of mesiodens in a 9-year-old boy.

Case report: A 9-year-old boy in mixed dentition presented with a chief complaint of an central diastema. Panoramic radiograph showed the presence of mesiodens in the anterior maxilla between the two central incisors. After clinical and radiographic examination, extraction of the mesiodens was carried out; subsequently was followed by the space closure utilizing simple fixed orthodontic therapy.

Comments: In mixed and early permanent dentitions, median diastema can be a major esthetic concern for patients and/or their parents. A mesiodens is often diagnosed coincidentally during a radiological examination. However, a mesiodens may also be diagnosed in relation to a clinically identified central diastema and an eruption disturbance, or a rotation of a central incisor. Early diagnosis allows the most appropriate treatment, often reducing the extent of surgery, orthodontic treatment and possible complications.

P12-201

Case report multiple dental anomaly in paediatric patients**R. INDRIYANTI***Department of Paediatric Dentistry, Padjadjaran University, Bandung, Indonesia*

Introduction: Diagnosis and treatment of dental anomalies comprise one important aspect of pediatric dentistry. Most dental anomalies will exist in childhood and some of them are not diagnosed or left untreated because their diagnosis is difficult due to lack of clinical experience. Genetic consultation is necessary for the diagnosis and the provision of advice on the prognosis and risk of recurrence in children and subsequent generations.

Case report: An 9-year-old girl came with complains of irregular anterior teeth placement. One tooth-shaped tapering caused aesthetic problems and pierced the inner lip mucosa. The result of the intra-oral and radiographic examination showed many anomalies found in both deciduous teeth and permanent teeth. In the maxilla there is mesiodens between central incisors as well as anterior and posterior teeth with fusion and gemination. In the mandibular anterior teeth, agenesis, fusion, makrodonia, tuberculum carabelli were found.

Comments: It takes a long-term care plan which includes appropriate aesthetic restoration, adequate repair of the masticatory functions, care of the the vertical dimension as well as, fabrication of permanent and temporary prostheses in childhood and adulthood and provision of orthodontic treatment. Provision of information and support to the children and their parents are essential.

P12-202

Intrinsic pigmentation in primary teeth due to neonatal hyperbilirubinemia**K. M. P. C. REZENDE¹, A. CARRILLO², S. RODAS DE CARRILLO², V. E. ARANA-CHAVEZ³ & M. BÖNECKER¹**

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Introduction: Hyperbilirubinemia is a high concentration of bilirubin in the blood and it is a common disease in most newborns, however some factors associated with it can indicate serious illnesses. Such newborns rarely manage to have long survival, except in cases of liver transplantation. If hyperbilirubinemia occurs during the period of teeth development, teeth may acquire a yellowish to greenish color shade.

Case report: The authors report a clinical case of a 7 year-old child who had intrinsic pigmentation in all primary teeth due to a partial atresia of bile ducts. The presence of primary upper and lower canines and molars was consistent with the chronological age of the patient and presented different levels of green pigmentation. The crowns of the primary molars were dark green in almost two thirds, while the primary canines were pigmented only at the incisal third. Tooth areas that were calcified after the hyperbilirubinemia period showed normal color, and a sharp dividing line was observed separating the green portion from the normal one in canines and molars. After exfoliation, the primary upper central incisors were processed for light microscopy examination and the specimens showed green lines in dentin, which exhibited normal and calcified structure with regular dentinal tubules.

Comments: We have followed the growth and development of this child since his referral to us about and the permanent teeth have not been affected by pigment. In this sense, the clinical characteristics of the teeth may help in the diagnosis of present or past systemic diseases.

P12-203

Supernumerary teeth in mandibular incisor region**Y. J. MAH***Department of Paediatric Dentistry, Mok-Dong Medical Center, Ewha Womans University School of Medicine, Seoul, Korea*

Introduction: Pediatric dentists often meet children with abnormal in number of tooth. Presence of supernumerary teeth is frequent cause of malocclusion. Etiology for supernumerary teeth is not yet clearly defined, but it is thought to be caused by excessive proliferation of dental lamina by hereditary and environmental factors. Supernumerary teeth occur in the maxilla nine times more frequently than in the mandible. Most common supernumerary tooth is the mesiodens in the maxilla, and some are observed in the maxillary molar and mandibular premolar. It occurs rarely in the mandibular incisor region with the incidence of 1–2% among all supernumerary teeth.

Case report: A six-year-old boy visited the department of the pediatric dentistry with the chief complaint of crowded supernumerary teeth on the mandibular incisor region. Clinical and radiographic examinations revealed six permanent mandibular incisors similar in size, shape, and length. Further investigation using computed tomography (CT) was proceeded on the mandible to measure and compare morphologic features and positions of the six incisors. Then, we decided to remove two incisors which were already erupted. Periodic check-up was followed to monitor the dental development and spontaneous positional enhancement of the remaining four incisors in the mandible.

Comment: In the children, when they have supernumerary teeth in their maxilla or mandible, an early diagnosis with appropriate tools and careful removal of them can be achieved by a paediatric dentist. Consequently, the children will have normal dental health.

P12-204

Management of avulsed central permanent incisor in 11 year-old boy using fixed orthodontic appliance**A. SETIAWAN***Paediatric Dentistry, Faculty of Dentistry, Universitas Padjadjaran, Indonesia*

Introduction: Avulsion of a permanent incisor requires a successful retention and its prognosis is enhanced by minimising extraoral time. It is still better to replant the tooth although it has been out of the mouth for an extended time period. The management of an avulsed permanent incisor includes the first aid management, replantation of the tooth, and followed by immobilizing it.

Aim: The aim of this paper is to report a case of an avulsed permanent incisor and its management, and also make a brief review of the treatment.

Case report: This is a case of 11 year-old boy who was injured falling from the stairs in his house and 11 was avulsed. Since the boy was left alone, he immediately restored his avulsed tooth into a cup of cold pasteurized milk and quickly seek for help. Thirty minutes after the accident, he was treated by a dentist. The avulsed tooth was rinsed by normal saline and briefly replanted to its socket. The immobilisation device was an orthodontic appliance to splint the traumatized tooth. Radiograph of the tooth was taken at the next day. Antibiotics were administered to the boy for 14 days, along with antiinflammatory drugs and calcium supplements. After 3 weeks, another radiograph was taken that showed there was no abnormalities in the periapical region and the tooth was stable.

Comments: It is concluded that appropriate first aid and treatment may enhance the prognosis of avulsed teeth.

P12-205

Unilateral mandibular condyle fracture in an 8 year-old: treatment and 1 year follow-up

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Introduction: Unilateral mandibular condylar process fractures can be treated by open or closed reduction. In children, closed functional therapy is the treatment of choice, providing early mobilization, adequate functional stimulation of condyle growth and bone remodeling.

Case report: An 8 year-old girl presented to be Yeditepe University, Faculty of Dentistry, Department of Pedodontics with an orofacial trauma after a fall. The extraoral examination revealed asymmetry in the mandible, a laceration on the chin and the patient was unable to close her mouth with. The intraoral examination revealed an immature contact on the unaffected side and severe pain during mouth opening. The panoramic radiography showed a unilateral condylar process fracture with anterior displacement, on the right side. The treatment was performed under general anesthesia and closed reduction with intermaxillary fixation, using an acrylic splint, was applied. The mandible was repositioned and vertical height was increased by 3 mm. The elastics were removed after 4 weeks and the splint was removed after 8 weeks. The patient was allowed to open her mouth on a weekly basis until the end of the treatment. Four months after the trauma, the normal shape and position of condyle was observed and healing was evident in the radiographic examination. The patient had good function after one year.

Conclusion: In order to maintain condylar growth and proper function, condyle fractures in growing patients should be conservatively treated in the present case. Closed reduction revealed good healing in the one year follow-up.

P12-206

Guided bone regeneration following teeth extractions in the anterior maxilla of a 15 years-old patient for future implant placement

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Introduction: Tooth loss after trauma is frequent during childhood and adolescence, especially in the anterior maxillary area. Periapical lesions following tooth necrosis and other posttraumatic complications left untreated for a prolonged period of time can provoke an extended resorption of the labial plate, complicating the future implant placement.

Case report: A 15 years-old, healthy, regular smoker male, presented to practice in October 2010. His chief complaints were swelling on the maxillary left labial area, accompanied by mobilization of teeth no. 21, no. 22 and pain on percussion. Patient stated that he had an accident during a basket-ball game

5 years ago. Clinical examination revealed that teeth no. 21, no. 22 were non-vital with degree III mobility and purulence associated to deep probing pocket depths of > 11 mm. Preoperative radiographic examination utilizing cone beam computed tomography (CBCT) showed a U-shaped periapical lesion extending 0.5 mm away from the nasal floor. Apical cracks were spotted intra-surgically and both teeth were extracted. The patient was advised to follow a smoking cessation program. Seven weeks later a bone augmentation surgical procedure was performed. CBCT and hand-wrist films were obtained 6 months post-surgically. Although adequate bone dimensions were noted, the incomplete growth dictates the delay of implant placement.

Comments: For the growing child or adolescent early implantation is not recommended, since osseointegrated implants behave like ankylosed teeth jeopardizing the long-term esthetic and functional outcome. Bone preservation and augmentation procedures can be applicable during growth, since the regenerated bone will follow the developing pattern of the growing maxilla.

P12-207

Treatment of primary anterior teeth with ready-made zirconia crowns (ZIRKIZ® crowns)

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Introduction: Many pediatric dentists face a dilemma regarding the restoration of primary anterior teeth. The material used for the restoration of primary anterior teeth needs to be strong enough to last until exfoliation, without sacrificing the look to fulfill esthetic requirements. However, current metal structures used for full coverage of primary anterior teeth up to now do not satisfy both the strength and esthetics needs simultaneously. Furthermore, because many other existing methods to fulfill the incompatible two factors also have disadvantages such as an increase of treatment time, a failure to fulfill esthetic desires and/or a loss of facing, they, therefore, cannot be considered as fully successful methods. Zirconia is a type of 'tooth-colored' ceramic which has been already used for prosthetics of permanent teeth. However, this is a customized method where the treatment fee is more expensive and the procedure requires two visits by the patient to the dental clinic. Therefore, this current customized method is not suitable for small children.

Case report: In order to meet the challenge to rectify these concerns we have developed a ready-made primary anterior crown from zirconia. This crown meets both the strength and esthetic requirements when treating primary anterior teeth. The advantages of ready-made zirconia primary anterior crowns (ZIRKIZ®) include the fulfillment of both strength and esthetic needs, a reduced preparation time because of the thin structure, an excellent soft tissue response as well as the possibility of shape adjustment.

Comments: This presentation will provide a brief overview of ready-made zirconia primary anterior crowns (ZIRKIZ®) and report some clinical cases.

P12-208

Restorative treatment of radiation-related caries. Case reportO.I. ADMAKIN¹, E. SKATOVA², M. AKIMOVA² & M. MAKEEVA²¹*Department of Paediatric Dentistry and Orthodontics, I.M. Sechenov First Moscow State Medical University, Moscow, Russia;*²*Department of Operative Dentistry, I.M. Sechenov First Moscow State Medical University, Moscow, Russia*

Introduction: The radiation-related caries is specific disease of tooth hard tissues after high dosage radiation during the cancer treatment. Direct damage of enamel from radio- and chemotherapy is quickly complicated with caries, because such patients have xerostomia and decreased local immunity.

Case report: A 15-year-old male patient was treated about Ewing sarcoma with radio- and chemotherapy. 3 months later radiotherapy patient noticed loss of enamel gloss and gray painless destruction area appearance. One year after cancer treatment the oral examination revealed rampant teeth lesion corresponded to the direction of radiation exposure – posterior teeth on the left side were intact. Also the gingival inflammation was presented because the good oral hygiene was impossible. Diagnosis was detailed during the treatment because any exams (except for visual) were painful. A treatment plan included: endodontic treatment of maxillary incisors, restoring the affected teeth with direct composite restorations (Gratia Direct) to improve the functional condition and the patient's appearance. The preventive management of dental disease was performed according the recommendations of Dental Disease Section/International Society of Oral Oncology (ISOO) (2010). At the 1-year follow-up, the patient was satisfied with the restorations both esthetically and functionally.

Comments: This case report described the dental management in cancer survivor patient. It is very important to remember that such patients need not only dental treatment, but especially compassion.

P12-209

Novel scheme for reduction of drug induced gingival hyperplasiaO. PANAHI¹ & E. TEVETOGLU²¹*College Of Dentistry, Istanbul University, Turkey;* ²*College of Dentistry, University of Ankara, Turkey*

Introduction: Gingival hyperplasia is characterized by progressive enlargement of the interdental papillae as well as the marginal and attached gingiva. In the condition's most pronounced form, the crowns of the teeth may be covered. Gingivae appears swollen, devoid of stippling and pale red to deep purple in colour. Drugs-induced gingival hyperplasia is a serious concern both for the patient and the clinician.

Case report: A 39 year-old Caucasian male patient with hypertension, who received Amlodipine (10 mg/day, single dose orally) for 66 days, sought medical attention because of the new-onset gingival enlargement. On clinical examination a generalized and firm overgrowth of the gingivae throughout the maxilla and the mandible were evident. The lack of gingival inflammation and purulent discharge were other features of the clinical scenario. Histological assessment of the biopsy specimen revealed hyperplasia of the connective tissue, epithelial acanthosis, and elongated rete ridges along with few inflammatory cells. The histological and

the clinical evidence were consistent with Amlodipine-induced gingival hyperplasia. We believe that the present report indicates the most rapidly developed case of Amlodipine-induced gingival hyperplasia reported to date. The related literature is reviewed and the underlying pathogenic mechanisms of this rare side-effect are discussed here.

P12-210

Conservative pulp treatment for young permanent tooth with apical lesion

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Introduction: Recently, undifferentiated stem cells have been newly discovered in dental apical papillae of immature permanent teeth and these stem cells seem to be the origin of ameloblasts related to the formation of root dentin. When treating immature permanent teeth, the preservation of these stem cells makes the continuous formation of roots complete. Therefore, it is reported that clinical and radiographic healing pattern was observed by pulp treatment with minimum invasion to apex of immature permanent teeth with apical inflammation.

Case report: In two boys, 10 and 12 years-old, instrumentation was limited in the apical region of permanent teeth diagnosed with pulp necrosis and apical abscess and MTA was applied inside the pulp chamber. The result of regular follow-ups showed the healing pattern of apical abscess and the development and growth of roots.

Comments: In immature permanent teeth with pulp necrosis and apical abscess, protection of pulp and dental papillae in the apical region showed fine prognosis during the follow-up periods. It is proposed that long-term clinical observation and examination of conservative pulp treatment in immature permanent teeth of young children is necessary.

P12-211

Endodontically treatment of the extra tooth fused to a mandibular second molarO. PANAHI¹ & E. TEVETOGLU²¹*College of dentistry, University of Istanbul, Turkey;* ²*Department of dentistry, University of Ankara, Turkey*

Introduction: When teeth are abnormal, morphology can predispose to periodontal disease, and careful management of fused teeth is essential.

Case report: Caries was removed from the tooth complex under local anesthesia. The pulp chamber of the supernumerary tooth was exposed without involvement of the second molar pulp chamber. The root canal of the supernumerary tooth was prepared using the step back technique and copious irrigation with 2.5% sodium hypochlorite. Obturation using the lateral condensation technique with gutta-percha and AH26 sealer was subsequently performed and final restoration was accomplished with composite resin. 10 month after the treatment, no clinical or radiographic concern is apparent, and the second molar tooth has remained vital.

Comments: In this paper we discussed and reported the rare case of a fused molar, supernumerary tooth and described the management.

P12-212

Intentional autotransplantation of a premolar tooth: management of dentigerous cyst

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Introduction: In children the frequency of odontogenic cysts is relatively low. The inflammatory exudates lead to the formation of a dentigerous cyst. Inflammatory dentigerous cysts are found in mixed dentition. They are associated with the roots of non-vital primary teeth and the crown of unerupted permanent successors. This case report describes the inflammatory dentigerous cyst treatment and intentional replantation of impacted a maxillary premolar tooth associated with dentigerous cyst with over 26 months follow-up.

Case Report: A 12-year-old girl was referred to Istanbul University Faculty of Dentistry Department of Pediatric Dentistry with complaint of a pain on the right side of the maxilla. A panoramic radiograph showed a radiolucency into which the roots of the primary second molar and the crown of the second premolar extended. At the first visit non-vital primary molar on the right were extracted. By extracting the infected primary teeth, opening the cyst and ensuring continuous drainage. A mucoperiosteal flap was raised and the impacted premolar was removed surgically and replanted into the socket immediately. Tooth was properly seated, checked for alignment and splinted with Ni-Ti arch wire.

Comments: Postoperative clinical controls revealed pulp vitality was positive after 26 months. The periradicular area had normal appearance and no evidence of root resorption or periapical lesion and intact lamina dura consistent with a healthy tooth. Proper occlusion and aesthetic rehabilitation was performed.

Poster Session P13/Dental Materials 3

P13-213

Effects of APF gel application on surface roughness, gloss and color of different type resin composites

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Background: Application of acidulated phosphate fluoride (APF) gel has been considered to cause deterioration of resin composites.

Aim: This study investigated the effects of APF gel application on color and gloss of resin composites.

Design: A2-shade resin disks of 2 mm thickness and final polished with 180-grit and 3000-grit SiC papers were made with Estelite Σ Quick (EQ), Clearfil Majesty (CM) and Beautifil (B2). Six disks were prepared for each group. APF gel (pH = 3.5) was applied 3 mm thickness on the top surface of resin disks and left for 30 min followed ultrasonic washing for 2 min. This procedure was repeated four times. The L*a*b* values, color difference (ΔE^*ab), opacity, surface gloss and roughness of specimens before and after APF application were compared. Data were analyzed ANOVA and Fisher's PLSD test with $\alpha = 0.05$.

Results: For the 3000-grit polishing groups, the order of influence of APF gel application on color of resin composites was CM > B2 > EQ. Both in the 180- and 3000-grit polishing groups, color difference before and after APF gel application was hard to detect (CM and B2) or impossible to detect (EQ) by naked eye. On the other hand, for all the resin composites, the gloss was significantly decreased by APF gel application, thus APF gel might cause the deterioration and dissolution of resin composites used in this study.

Conclusions: In the limit of this study, supra-nano spherical filled Estelite Σ Quick showed the least change on color, gloss and surface roughness by APF gel application.

P13-214

Different concentrations of chlorhexidine stabilize *in vitro* bond strength in primary dentine

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Aim: To assess the effect of different concentrations of 0.5% and 2% chlorhexidine digluconate on bond strength of primary tooth dentine, of a one bottle total etch conventional adhesive system, immediately and after 12 months.

Design: Twenty-one sound primary molars had their occlusal dental surface exposed and were randomly assigned into three groups ($n = 7$), one control and two experimental. The bonding procedure was performed in control group (A) using 37% phosphoric acid gel (15 s), then washed (15 s), air dried (30 s) and rehydrated with water. Groups B and C were treated similarly to Group A. However, the rewetting was performed respectively with 0.5% and 2% chlorhexidine for 30 s. After placement of composite resin, the samples were submitted to serial cuts, creating bonded sticks tested in tension: immediately (IM) or after storage in artificial saliva for 12 months (12M). The bond strength data were evaluated by two-way repeated measures ANOVA and Tukey's *post-hoc* test.

Results: There was no significant reduction in bond strength values when chlorhexidine was used at concentrations 0.5% (IM = 49.3/2.6 and 12M = 32.3/7.9) and 2% (IM = 44.0/8.7 and 12M = 34.6/5.1). On the other hand, significant reduction in bond strength was observed in the control group (IM = 50.8/12.8 and 12M = 20.4/3.7).

Conclusions: This study validates the concept that inhibition of MMPs by chlorhexidine solution, at different concentrations, may prevent the bonding interface degradation, reducing the loss of bond strength in primary teeth over time.

P13-215

Influence of pH cycling on surface hardness of glass ionomer cements

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Aim: This study evaluated the influence of pH cycling in surface Knoop hardness of the glass ionomer cements.

Design: Eighty specimens using four different glass ionomer cements were prepared: N100 (3M ESPE), Vitremer (3M ESPE), Fuji IX (GC AMERICA), Maxxion R (FGM) following the manufacturer's dosage and handling. After 10 min, the specimens were deposited in liquid paraffin where they remained for 24 h, at 37°C. The samples were divided into two groups, with and without pH cycling. Hardness measurements were performed in three periods of time: after 24 h, 14 and 30 days. The hardness test used was Knoop hardness with 25 g for 5 s. Data were subjected to normality Kolmogorov-Smirnov test. After observing the normality of data a three way ANOVA was carried out. The level of significance was 5%.

Results: Ketac N100 showed lower hardness values than the others, and the pH cycling had no influence on hardness. There was a reduction in hardness values for Vitremer, Fuji IX and Maxxion.

Conclusions: The pH cycling reduces surface hardness for Vitremer, Fuji IX and Maxxion. Ketac N100 does not show reduction in hardness after pH cycling.

P13-216

Ex vivo comparative study of four adhesive systems in primary dentition

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Background: Self-etching adhesive systems show easier handling and less operative time than conventional etching single bottle systems when used in pediatric patients.

Aim: To compare ex vivo shear bond strength on enamel and dentine of four adhesive systems in primary teeth.

Design: Composite cylindrical samples, 3.8 × 2 mm, (Z 350 A1 enamel) were bonded to healthy enamel and dentine flat surfaces. They were used according to the manufacturer's instructions. Adhesives used were Adper Single Bond 2 (ASB), Adper SE Plus (ASE), Easy Bond (EB), (3M/ESPE), and Futura Bond NR (VOCO) (FB). Samples were divided into four groups according to the bonding system used, and each was divided into two subgroups depending on the substrate (enamel-E- or dentine-D). They were then stored in distilled water at 37°C for 24 h and shear bond strength was determined using a universal testing machine (Instron Corporation).

Results: Were analyzed using analysis of variance (ANOVA).

Results: mean and standard deviation for each material was: ASB 14.5 (4.40), ASE 8.17 (3.01), EB 4.03 (2.38) and FB 9.95 (3.21), and on dentine: ASB 5.25 (4.83), ASE 8.75 (3.55), EB 10.59 (2.78) and FB 4.3 (1.23). ANOVA showed statistically significant differences between substrates ($P < 0.05$) and no significant among materials or their interaction ($P > 0.05$).

Conclusions: All four adhesive systems showed, overall, ex vivo similar shear bond strength on enamel and dentine of primary teeth. Clinical research should be carried out in order to perform a more exhaustive analysis.

P13-217

Fluoride release and uptake capacities of aesthetic restorative materials

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Aim: The purpose of this study was to investigate the fluoride releasing and recharging ability of five aesthetic restorative materials.

Design: Five aesthetic restorative materials were used in this study; a composite resin Wave (SDI), a compomer Dyract Extra (Dentsply), a giomer Beautiful II (Shofu), a resin modified glass ionomer cement Ketac N100 (3M ESPE), a conventional glass ionomer cement GC Fuji IX (GC Corp) and one non-fluoride releasing composite resin Filtek Z250 (3M ESPE) was used as control. Eight disk-specimens of each material were prepared and immersed individually in 4 mL deionized water in plastic vials.

Fluoride release was assessed over an 86-day period for all materials using fluoride ion-selective electrode. On day 86 specimens were soaked for 5 min in solution of 0.02% NaF and daily, fluoride release was determined for 5 days. This repeated three times, as well for solutions of 0.04% and 0.2% NaF. Results were statistically analyzed by one-way ANOVA and Bonferroni *post hoc* test.

Results: In terms of total fluoride released over the 86 days period: GC Fuji IX (361.6 µg/cm²) > Ketac N100 (189.8 µg/cm²) > Dyract Extra (41.77 µg/cm²) > Beautiful II (20.81 µg/cm²) > Wave (14.58 µg/cm²) > Filtek Z250 (0.45 µg/cm²), ($P < 0.05$). Significantly more fluoride was released for all materials for all three refluoridation periods and for all different concentrations on first day after refluoridation compared to the fifth day after refluoridation ($P < 0.05$).

Conclusions: All restorative materials showed an ability to release and uptake fluoride, but in different quantities.

P13-218

Glass ionomer cements bonding to caries-affected dentine in primary teeth

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Background: Adhesive materials are required to adhere to surfaces different from those for which they were developed, making imperative to study adhesion to caries-affected dentin.

Aim: To evaluate dentine bonding by microtensile test and nanoleakage of glass ionomer cements (GIC) in two different primary dentine substrates.

Design: Thirty-six primary molars received occlusal preparations, half were submitted to caries induction, leading to caries-affected ($n = 18$) and sound ($n = 18$) substrate. Three materials were used: resin modified GIC with nanoparticles Ketac Nano (KN); a resin modified GIC Vitremer (VI) and a high viscous glass ionomer cement Ketac Molar Easy Mix (KM). After 24 h storage, teeth were sectioned obtaining bonded sticks to be tested in tensile. One stick from each tooth was immersed in silver nitrate solution (24 h) and revealed for 8 h. The bond strength means were analyzed by two-way ANOVA and Tukey *post hoc* test. For nanoleakage, Kruskal-Wallis and Mann-Whitney tests were used (5% significance).

Results: Mean (and standard deviations) for each material, in sound substrate: KN – 35.2 (9.4); VI – 29.2 (7.8); KM – 18.8 (2.7). For caries-affected: KN – 35.8 (6.7); VI – 24.9 (5.7); KM – 14.5 (0.7). KM showed the lowest bond strength values ($P < 0.05$), and VI and KN were similar ($P > 0.05$). KM showed more percentage of cohesive failure, especially in caries-affected dentine substrate. Sound or caries-affected dentine did not affect the silvernitrate infiltration into the interface.

Conclusions: We may conclude that the presence of carious lesions in dentine does not jeopardize the bonding of glass ionomer cements tested to dentine.

P13-219

Bisphenol-A release from fissure sealantsC. H. FINKE¹, G. EREK¹, C. PIECHOTTA², I. NEHLS² & P.G. JOST-BRINKMANN¹¹Department of Orthodontics, Dentofacial Orthopaedics and Paedodontics, Charité - Universitätsmedizin Berlin, Germany;²Reference Materials, Department of Analytical Chemistry, BAM Federal Institute for Materials Research and Testing, Germany**Background:** Bisphenol A is a degradation product of Bis-GMA or Bis-DMA suspected to have estrogenic effects.**Aim:** The objective of this study was to investigate the release of Bisphenol A from two dental fissure sealants (Fissurit, VOCO; Delton FS, DENTSPLY).**Design:** Beside Fissurit and Delton FS a positive (Bis-GMA based resin) and a negative (TMXDI, an experimental Bis-GMA free sealant) control provided by Ivoclar Vivadent were tested. For each material 21 specimens (8 mm diameter, 3 mm high) were produced by placing the material in a glass mold and light curing for 40 s from both sides with a LED light (Valo, Ultradent). Subsequently, the test specimens were stored in glass vials with 20 mL deionized water and shaken for 24 h at room temperature. The 21 discs per material were randomly allocated to three groups ($n = 7$). The Bisphenol A release of the materials was tested according to EN 14372:2004 (E). After extraction the resulting eluates were separated by high liquid chromatography (LC). Subsequently, Bisphenol A was analyzed by fluorescence-, diode-array-detection and mass spectrometry (MS).**Results:** While no Bisphenol A was detected in the eluates of Fissurit, Delton FS and TMXDI, more than 11.0 ng Bisphenol A/ml were detected for the positive control group via LC/MS/MS. However the peak level was not enough to determine Bisphenol A quantitatively.**Conclusions:** Unexpectedly, no significant Bisphenol A release from fissure sealants was found under this study design. However, before drawing premature conclusions a wide range of conditions should be tested.

P13-220

The influence of etching and re-mineralization time on enamel re-mineralization of deciduous teeth

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*Shanghai Key Laboratory of Stomatology, Department of Paediatric and Preventive Dentistry, Ninth People's Hospital, College of Stomatology, Shanghai Jiao Tong University School of Medicine, Shanghai, China***Aim:** To study the effect of etching time and remineralization time on the enamel re-mineralization of deciduous teeth using confocal laser scanning microscopy (CLSM).**Design:** Twenty-eight primary incisors were used in this experiment. Four rectangular windows were created in the labial surface of each incisor, randomly assigned to four treatment groups (Group A,B,C,D). The windows in group A,B,C,D were etched

30 s, 60 s, 90 s and 120 s respectively with 32% phosphoric acid gel. All the samples were rinsed and re-mineralized in artificial saliva for 0, 2, 24 h. CLSM was applied to study the de-/re-mineralization. Average Lesion Fluorescence (AF) for each sample was recorded at each time point of 0, 2, 24 h. The data was analyzed with repeated measurement. The significance was 0.05.

Results: The results of MANOVA showed both etching time and re-mineralization time had a significant effect on the value of AF ($F = 357.74$, $P < 0.0001$, $F = 51.62$, $P < 0.0001$ respectively). Bonferroni analysis indicated that the difference of AF between each group was significant except that between 90 s and 120 s. The difference of AF between each time point within each group was significant.**Conclusions:** It was inferred that the etching time was no more than 60 s, and the re-mineralization time may be 24 h when the acid-resistance and remineralization potential of primary teeth were examined.

P13-221

Proximal art restorations using two layers insertion of GIC: preliminary resultsD. HESSE¹, C. A. B. GUGLIELMI¹, C. C. BONIFÁCIO², M. BÖNECKER¹, E. VAN AMERONGEN² & D. P. RAGGIO¹¹Faculdade de Odontologia USP, São Paulo, Brazil; ²ACTA, Amsterdam, The Netherlands**Background:** Good survival rates for single-surface ART restorations have been reported while multi-surface ART restorations have not shown similar results.**Aim:** The aim of this study was to verify the survival rate of proximal ART restorations using a flowable layer of glass ionomer cement (GIC) as a liner (two layers technique), comparing to conventional ART.**Design:** A total of 138 primary molars with proximal caries lesions were selected in 6–7 years old children in Barueri city, Brazil. The patients were randomly allocated in two groups: G1 – conventional restoration and G2 – two layers technique. After caries removal with hand instruments, G1 were restored with GIC (Fuji IX – GC) and teeth from G2 were restored using two layers GIC technique, with same material (first layer with flowable consistency - powder/liquid ratio 1:2 and second layer mixed conventionally). Restorations were evaluated after 1 and 6 months according to Roeleveld et al. (2006) criteria. Mann-Whitney test was applied for differences regarding groups, and Wilcoxon test was performed to search for differences between time periods, in each group (5% significance). **Results:** Regarding restorations success, there was no difference between techniques in 1 month ($P = 0.17$) and 6 months ($P = 0.65$). In G1, there was significant difference between both evaluations ($P = 0.007$), showing an increase restoration failure between 1 and 6 months. In G2, there was no difference in time ($P = 0.62$).**Conclusions:** Flowable GIC layer in proximal cavities before the insertion of a regular GIC layer does not improve approximal restoration in early assessment.

P13-222

Effects of media and toothbrushing on microhardness of restorative materials

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Background: Surface hardness is one of the most important physical characteristics of dental materials. Soft drinks may have destructive effect on restorative materials as well as on dental tissues.

Aim: The aim of this study was to evaluate the effects of various children's soft drinks and tooth brushing on the surface microhardness of restorative materials.

Design: Forty disk-shaped specimens (10 mm diameter × 1.5 mm height) of each of three restorative materials; compomer (Dyract AP), glass ionomer cement (Ionofil Molar AC) and composite resin (Filtek Z250) were prepared. The specimens were divided into four subgroups ($n = 10$), immersed in four staining solutions (cheery juice, cola, chocolate milk and distilled water) for 3 h daily over a 60-day period. The subgroups of materials were then divided into two subgroups ($n = 5$) as with and without brushing. In the brushing group, the specimens were brushed with toothpaste once a day using an electrical tooth brush. Microhardness of materials was calculated at baseline and after 60 days. Analysis of variance and t-test were used to analyze the data.

Results: In all solutions, there was a significant increase in the surface hardness of composite resin group, whereas surface hardness of glass ionomer cement group decreased significantly ($P < 0.05$). Surface hardness of compomer group decreased in all solutions; however this decrease was only significant in cola and cherry juice ($P < 0.05$). Brushing didn't affect the surface hardness of all restorative materials ($P > 0.05$).

Conclusions: Cola and cherry juice decrease microhardness of compomer and glass ionomer cement in long-term immersion periods.

P13-223

Effect of disposable infection control covers on power density and spectral output from dental light curing units

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Background: To prevent contamination, disposable covers [DCs] may be placed over dental light curing units [LCUs].

Aims: This study compared the effect of seven DCs on power density [PD], measured in J/cm² and spectral output of four LCUs. The hypothesis was that DCs would not affect PD or spectral output of the LCUs.

Design: Four LCUs (Elipar S10, 3M ESPE; Bluephase, Ivoclar Vivadent; Demi, Kerr; Deguluxsoftstart, Degussa) and seven DCs (Tublex, Omnia; Bluephase Sleeve, Ivoclar Vivadent; Valo, Ultra-dent; Disposa-Shield, Dentsply; Pinnacle Cure Sleeve 4500, Kerr;

CLS-250 Pinnacle Complete Curing Light Sleeve, Kerr; ClingFilm, Tesco) were used. Spectral output and PD were measured using MARC (BlueLight Analytics inc., Halifax, NS) for each LCU without a cover [control], and with each DC. Curing time was 10 s as recommended by the LCU manufacturers. Measurements were taken 10 times for each DC/LCU and means [SD] calculated. Data were analyzed using 2-way ANOVA.

Results: There was a significant difference in PD [control] between the LCUs ($P < 0.05$).

With each LCU, DCs, except ClingFilm, significantly reduced the PD ($P < 0.05$). The spectra from covered LCUs were similar to the control spectra in all cases.

Conclusions: DCs can significantly reduce the PD compared to uncovered LCUs. Apart from PD reduction, the spectra from covered LCUs were similar to the controls, indicating that none of the tested covers acted as a light filter. Covered LCUs should be tested for PD prior to routine use in order to determine adequacy of delivered PD.

P13-224

Bond strength of self-etch adhesives to deciduous tooth caries affected dentine applied ER: YAG laser

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Aim: The purpose of this study was to evaluate the effect of Er:YAG laser system on the bonding ability of two different self etching adhesives to caries-affected dentine.

Design: Ninety extracted primary molars were used in this study. Dentine surfaces, obtained from sound and caries-affected human primary dentine, were treated with an Er:YAG laser or a bur. The prepared surfaces were restored with one of the each adhesive system (XenoV, Dentsply; ClearfilS3, Kuraray) and a compomer (Dyract Extra, Dentsply). The samples were sectioned with low speed saw. Totally, 162 stick samples were obtained and the bond strength of the adhesive systems was tested by the micro-tensile test method. The data were statistically analyzed.

Results: The values of the highest bond strength were obtained from ClearfilS3-Er:YAG laser-sound dentine group (24.57 ± 7.27 Mpa) ($P < 0.05$). The values of the lowest bond strength were obtained from XenoV-Er:YAG laser-sound dentine group, XenoV-bur-sound dentine group, XenoV-Er:YAG laser-caries affected dentine group, XenoV-bur-caries affected dentine group, respectively (11.01 ± 3.89 ; 12.10 ± 4.80 ; 13.12 ± 4.33 ; 12.39 ± 5.03 Mpa) ($P < 0.05$).

Conclusions: It was determined that the bond strength of the ClearfilS3 bonding agent was higher than that of the XenoV bonding agent on the surfaces applied Er:YAG laser and bur to both sound and caries-affected dentine.

P13-225

Comparative effects of hydroxyapatite and hydroxyapatite with platelet rich plasma in apexogenesis: study on experimental animals

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Background: Apexogenesis is a process of development and formation of the root apex under physiological conditions and under a regenerative therapy procedure as well. This process is crucial for the destiny of teeth with affected pulp.

Aim: The aim of this study was to evaluate and compare the effects of hydroxyapatite (HAP) and hydroxyapatite with platelet rich plasma (HAP+PRP) applied on exposed pulps in teeth with immature apex formation.

Design: Study included eight young monkeys, with incomplete root formation of permanent dentition. The treated teeth were divided into two groups: in the first group pulpotomy with HAP application was done and in the second group it was done pulpotomy with HAP+PRP application. Evaluation of root growth was recorded by radiographs after 3 and 12 months. The Animal Ethical Screening Committee permission was obtained prior to investigation.

Results: The obtained results shown an increase in bridge formation in HAP + PRP(75%) group after 3 months comparing to HAP group (50%). However after 12 months there were no significant differences between the groups. The root delay was not registered in the HAP+PRP group contrary to HAP group where it was registered in 25% after 12 months. Obliterations of root canal, presence of denticles or presence of deformities in periapical region were not recorded.

Conclusions: Materials used in this study are convenient as capping agents, contributing in maintaining the integrity of the pulp tissue and facilitating root and periodontium formation. According to results, it could be suggested that hydroxyapatite with platelet-rich plasma represents a superior alternative to hydroxyapatite alone, but without statistically significant differences.

P13-226

Dental health and restorative materials in primary teeth – a practice based study

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Background: In Finland, most children have healthy teeth, but some are at high risk for getting caries lesions. Controlling caries is the main goal for paediatric dentistry, but restorative dentistry still remains a challenging part of everyday practice. Poor oral health conditions and technical difficulty in placing restorations cause a threat for longevity of fillings in primary teeth. There are no recent practice based longitudinal studies on the longevity of restorations in primary teeth.

Aim: The aim of this study was to compare the survival of restorations in primary molars by age cohorts, considering the risk for caries.

Design: The data were obtained from the files of the Public Health Center of Kemi, Finland and were collected from four age cohorts; 1985, 1990, 1995 and 2000. Total number of restorations was 2755. The data were analyzed using the Kaplan-Meier method. The risk definition was based on the early restorations in first permanent molars.

Results: Survival of the restorations was significantly shorter in children at high risk for caries than in children at low risk ($P < 0.001$). The survival of the restorations was the shortest in the 1995 cohort and the longest in the 1985 cohort ($P < 0.001$). The greatest difference was between the 1990 and the 1995 cohorts.

Conclusions: Restorations survive longer in primary teeth of children at low risk for dental caries than in children at high risk. Survival of restorations is poorer in younger than in older cohorts, which may be due to degradation of children's dental health during last decades.

P13-227

Measurement of tensile properties between composite resin (CR) and resin modified glass ionomer cement (RMGIC)S. FRAGKOU¹, A. NIKOLAIDIS², D. TSIANTOU¹, D. ACHILIAS² & N. KOTSANOS¹¹*Department of Paediatric Dentistry, Aristotle University of Thessaloniki, Greece;* ²*Laboratory of Organic Chemical Technology, Department of Chemistry, Aristotle University of Thessaloniki, Greece*

Background: The clinical success of large class II RMGIC/CR (open sandwich) restorations in permanent or primary molars may be influenced by certain bonding parameters.

Aim: To examine the effect of curing mode and bonding type between a CR and a RMGI on tensile properties.

Design: A CR (Z250), a RMGI (Vitremmer) and a bonding agent (Single Bond 2) were used. Five groups of seven specimens each were prepared in a teflon mould $22 \times 5 \times 1$ mm. The bond at specimen center between the two materials was created by: A) 1-step placement of RMGIC in contact to CR, then photocuring, B) 2-step RMGIC placement/curing followed by CR placement/curing, C) 3-step RMGIC placement/curing, bonding placement/curing, CR placement/curing, D) RMGI only placement/curing (negative control), E) C/R only placement/curing (positive control). The specimens were subjected to tensile stress measurements in an Instron dynamometer at ambient temperature. The tensile bond strength, tensile strain and elastic modulus were calculated and examined with One-Way ANOVA and Tukey test.

Results: Group E presented significantly higher tensile properties compared to Group D. Group C exhibited significantly higher tensile strain (%) means comparing to group A and B. ($A = 0.47 \pm 0.12$, $B = 0.60 \pm 0.19$, $C = 0.98 \pm 0.24$, at $\text{sig} = 0.05$). Moreover, the tensile strength (MPa) of Group C was also higher compared to group A and B ($A = 11.90 \pm 5.75$, $B = 14.15 \pm 4.75$, $C = 19.08 \pm 4.05$). No statistically significant differences were observed in the elastic modulus ($A = 27.37 \pm 3.55$, $B = 29.26 \pm 3.64$, $C = 27.95 \pm 1.02$).

Conclusions: The use of bonding agent in a 3-step curing mode increased the tensile bond strength and the tensile strain.

P13-228

Glass-ionomer cement bonding to primary dentine after two methods of insertion

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Background: High viscous glass-ionomer cements (GIC) are indicated for Atraumatic Restorative Treatment; however its reduced flow capacity may hinder the complete filling of the cavity. Thus, the insertion of the material in two layers –the first one more fluid (powder/liquid ratio 1:2) may facilitate material accommodation.

Aim: To evaluate bond strength of high viscous GIC to sound and caries-affected primary dentine substrates, after two methods of insertion (one or two layers).

Design: Dentine surfaces of 20 primary molars were exposed and half of them were submitted to caries challenge by pH cycling model (10 days). Specimens were then assigned into four groups ($n = 5$), according to substrate and method of insertion. High viscous GIC Fuji IX was used as the restorative material and after the preparation according to experimental groups and 24 h storage, specimens were sectioned obtaining bonded sticks (0.7 mm²), and tested in universal machine. To perform statistical analysis, specimens presenting premature failures were included with a value of 4.0 MPa. Means were analyzed by two-way ANOVA and Tukey *post hoc* test ($\alpha = 5\%$).

Results: No significant difference was observed in bond strength for the methods of insertion of GIC, considering both substrates ($P > 0.05$). However, lower values of bond strength were achieved for the caries-affected dentine when the material was applied in two layers ($P = 0.02$).

Conclusions: Bond strength of GIC to primary dentine is negatively influenced by the presence of carious dentine when the material is inserted in two layers.

P13-229

SEM analysis of adhesive system/dentine interfaces on ER:YAG laser or bur prepared cavities

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Background: Morphological analysis of resin-dentine interfaces is required for clarification of interaction patterns formed on lased dentine/adhesive bonding.

Aim: The objective of this study was to assess the adhesive system/dentine interfaces on Er:YAG laser or bur prepared cavities.

Design: Twelve noncarious third molars embedded in epoxy resin were sectioned transversely at a distance of 2 mm from the occlusal surface. Class I cavities (2 × 2 × 1 mm) were prepared on dentine surfaces with Er:YAG laser (FidelisPlusIII, Fotona; 200 mj/20 Hz) or diamond bur. The specimens were randomly assigned to eight groups: Group1:Er:YAG laser Clearfil S3 Bond (Kuraray Co Ltd); Group 2:Er:YAG laser + AdperSE Plus(3M Espe); Group 3:Er:YAG laser + laser etch (80 mj/10Hz) + Adper Single-

bond2(3M Espe); Group 4:Er:YAG laser + acid etch + Adper Singlebond 2; Group 5:Er:YAG laser + Adper Singlebond 2 (no etching); Group 6:Bur + acid etch + Adper Singlebond 2; Group 7:Bur + Clearfil S3 Bond; Group8:Bur + AdperSE Plus. All adhesive and composite (Filtek Z250, 3M Espe) materials were applied according to the manufacturers' instructions. Specimens were sectioned vertically and prepared for SEM analysis. The hybrid layer and resin tags were examined under SEM at 500–3000x magnification.

Results: Laser prepared cavities have revealed gaps on adhesive/dentine interfaces. Hybrid layer was observed in all groups except the groups with no etching; hybrid layers in lased dentine have exhibited more irregular and non-homogeneous pattern than the conventionally prepared dentine. Conical shaped resin tags in acid-etched groups and cylindrical shaped resin tags in non-etched cavities were observed.

Conclusions: The findings of the study have demonstrated that Er:YAG laser has an adverse effect on continuity and integrity of the hybrid layer.

P13-230

The possible co-operative role of strontium and fluoride in glass ionomer cements in reducing demineralization of artificial hydroxyapatite tooth analogues

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Background: Glass ionomer cements (GICs) have the ability to remineralize incipient carious lesions by the release of ions which aid in preserving tooth structure. Modern GICs may contain strontium as well as fluoride to enhance radiopacity, and also to possibly enhance remineralization.

Aim: The aim of this study was to study the possible co-operative effect between the fluoride and strontium in GICs on de/re-mineralization using Scanning Microradiography (SMR) a directly quantitative X-ray absorption technique.

Design: Eleven GICs with varying ratios of strontium to fluoride were prepared. Compressed HAP discs (20 mm diameter, 3 mm thickness, 20% nominal porosity) were used as tooth analogues. 5 mm diameter holes were drilled into the HAP discs and filled with GICs. Discs without GICs and Fuji IX GIC were used as controls. SMR was used to measure the rate of demineralization of the treated HAP discs during exposure to demineralizing solutions at pH 4.0, simulating carious conditions.

Results: Increasing the fluoride in the GICs decreased the rate of demineralization of the HAP tooth analogue discs, whereas, increasing the strontium increased the rate of demineralization of the HAP tooth analogue discs.

Conclusions: Strontium and fluoride in GICs do not have a co-operative effect in preventing demineralization during artificial caries studies. Strontium may have a caries inhibitory role, but may not be released from GICs at sufficient concentration to have a caries inhibitory effect. Increasing the strontium to fluoride ratio in GICs may increase the rate of demineralization.

P13-231

Adhesive systems bonding to caries-affected dentine in primary teeth

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Background: Sound and caries-affected dentine coexist in cavity preparations, making imperative to study adhesion to both substrates.

Aim: To evaluate bonding by microtensile and nanoleakage tests of adhesive systems in sound and caries-affected dentine in primary teeth.

Design: Thirty-six primary molars received occlusal preparations, half were submitted to caries induction (pH cycling), leading to caries-affected ($n = 18$) and sound ($n = 18$) substrate. Three materials were used: total-etch adhesive system Adper Single Bond 2 (SB), two-step self-etch adhesive system Adper SE Plus (SE) and one-step self-etch adhesive system Adper Easy One Self-etch (EASY). After 24 h storage, teeth were sectioned obtaining bonded sticks to be tested in tensile. One stick from each tooth was immersed in silver nitrate solution (24 h) and revealed for 8 h. The bond strength means were analyzed by two-way ANOVA and Tukey *post hoc* test. For nanoleakage, Kruskal-Wallis and Mann-Whitney tests were used (5% significance).

Results: Mean (and standard deviations) for each material, in sound substrate: SB – 37.32 (3.95); SE – 18.77 (7.23); EASY – 27.12 (2.42). For caries-affected: SB – 19.36 (4.06); SE – 13.29 (3.43); EASY – 14.32 (5.79). SB showed the higher bond strength values to sound dentine ($P < 0.05$), whereas to caries-affected dentine there was no difference among materials ($P > 0.05$). We found more percentage of adhesive failure especially in sound dentine substrate, independent of adhesive system. Sound or caries-affected dentine did not affect the silver nitrate infiltration into the interface.

Conclusions: The presence of carious lesions in dentine influences the bonding of total-etch and one-step self-etch adhesive systems tested.

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SEM evaluation of chemomechanical caries removal using Carisolve

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Background: Using rotary instrument to remove caries will destroy much demineralized dentin and cause dental fear.

Aim: To compare the efficacy of chemo-mechanical caries removal (Carisolve) and the rotary instrument *in vitro*.

Design: Ten freshly extracted teeth with dentin caries were sectioned along the dental axis. Half of each carious lesion was prepared using the Carisolve and the other half using rotary instrument. Then the cavity surfaces were evaluated by SEM.

Results: The smear layer and bacteria left in the cavity wall after caries removal with Carisolve was much less than using rotary instrument. The surface of cavity was rough after caries removal with Carisolve method.

Conclusions: The Carisolve method was more effective than the rotary instrument in removing smear layer and bacteria. More demineralized dentin in cavity was conserved when treated with Carisolve chemomechanical method compared to the rotary instrument.

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Cytotoxicity of pulpotomy agents: an *in vitro* study

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Background: Pulpotomy procedure involves the application of a medicament, drug or dressing to the exposed pulp in order to preserve tooth vitality. Several materials have been used in dentistry as pulpotomy agents, such as formocresol or ferric sulfate. Recent studies support the clinical use of mineral trioxide aggregate as pulpotomy agent. Relative few studies have been published on the *in vitro* biocompatibility of pulpotomy agents.

Aim: The aim of this study was to evaluate the effects of four pulpotomy agents on cell survival and proliferation of cultured cells.

Design: The experiments were performed on rat pulp cells RPC-C2A cells grown as monolayer cultures at 37°C, in atmosphere containing 5% CO₂ in air and 100% relative humidity. The pulpotomy agents (ferric sulfate, formocresol, mineral trioxide aggregate and calcium hydroxide) were placed in culture medium, and the extraction media after serial dilutions were applied to cells. The effect was assessed by a modified sulforhodamine B staining assay, in reference to controls (cells not exposed to pulpotomy agents). All experiments were performed at least twice in six replicates. Non-parametric tests were used to evaluate the statistical significance of the results at level of significance $P = 0.05$.

Results: Overall, the degree of cytotoxic effect in ascending order was mineral trioxide aggregate < calcium hydroxide < ferric sulfate < formocresol.

Conclusions: Mineral trioxide aggregate exhibited the lowest effect on cell survival and proliferation whilst formocresol was the most toxic agent tested ($P < 0.05$).

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Current practice on the use of dental materials and influence of parental opinion in Chile

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Background: Pediatric dentists today have many materials to choose from when restoring posterior primary teeth. The clinical judgment as to which restorative material to use is complex, involving factors related to the tooth, patient, clinician and properties of the restorative materials. When the decision involves children, their behavior and parent's demands also need to be considered.

Aim: Determine the current practice and perception of parents' opinion regarding the use of dental materials.

Design: A questionnaire was completed by 151 attendees of the Chilean Society of Paediatric Dentistry Congress in Santiago in 2010. The questionnaire consisted of 17 items including current practices and parents' opinions. The results were analyzed according to socioeconomic status (SES) and years of experience.

Results: Most dentists (50.5%) prefer amalgam for restoring an ideal Class II lesion, while 32.7% choose composites and 12.2% Resin Modified Glass Ionomer. 34.11% of the dentists use amalgam often while 14.7% never. There was a significant difference according to SES: dentist treating patients from low SES use amalgam more often ($P = 0.065$). The role parents play in dentist's decision is mainly secondary (60.2%), although it is considered more important in high SES ($P = 0.036$). Parents' main concerns when choosing the materials were aesthetics (46.4%) and durability (41.0%). Toxicity was only an issue for 1.8%, being higher in parents of high SES.

Conclusions: Current practices on the choice of dental materials vary considerably. There is a significant relation between the material chosen and the SES of the patient. Parents' main concerns are aesthetics and durability.

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Bond strength of self-adhesive cements to deciduous enamel

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Background: It is not easy for the pediatric dentist to splint traumatized deciduous teeth with conventional etch-and-rinse resin cements in younger children, because the etch-and-rinse resin cements are often time-consuming to use as well as sensitive to handling due to the pretreatment steps involved. Self-adhesive cements have recently been made available to deal with this problem.

Aim: The purpose of this study was to evaluate the shear bond strength of self-adhesive cements to deciduous enamel.

Design: Three kind of commercially available self-adhesive cements were used: RelyXTM Unicem (3M ESPE), Clearfil SA Luting (Kuraray) and G-Luting (GC). Super-Bond C&B (Sun Medical) was used as a control. To evaluate the relationship between mechanical properties and bond strength, three-point bending strength of the self-adhesive cements was measured according to ISO4049:2000. The buccal surface of extracted human deciduous incisors was ground by SiC abrasive paper (#600), and applied the self-adhesive cements on tooth surface and light-cured without loading. After 24 h storage in 37°C distilled water, the shear bond strength to human deciduous enamel was measured according to ISO/TS 11405:2003.

Results: The flexural strength of the self-adhesive cements was in the order of G-Luting, RelyXTM > Clearfil SA luting. There was no significant difference between G-Luting and RelyXTM. The mean shear bond strength of G-Luting and Super-Bond C&B was 4.1 ± 3.1 MPa and 5.1 ± 1.7 MPa, however, there was no significant difference between them.

Conclusions: The results suggest that self-adhesive cements would be useful as a splint material for fixation of luxated deciduous teeth.

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Adhesion of silorane based restorative system

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Aim: The aim of this *in vitro* study is to investigate adhesion of the novel low-shrink silorane based restorative system to primary tooth and some dental materials.

Design: For this study extracted human primary and permanent molars which were free from caries were used. Cylindrical acrylic blocks were used to determine the adhesion of silorane to MTA and glass ionomer cement. Silorane-based restorative system was used for the test group. For the control group methacrylate-based composite and dentin bonding system was used. Shear test was performed to determine the bonding strengths. The surfaces of broken samples were detected under stereomicroscope. Data were evaluated by statistical analysis.

Results: Statistical analysis revealed that silorane restorative system resulted lower shear bond strengths both for primary and permanent molars. Also both the test and the control group showed lower shear bond strengths for primary teeth. It was observed that most of the failures in all groups were adhesive type failure between teeth and material. Silorane displayed lower bond strength value for both MTA and glass ionomer cement.

Conclusions: Silorane based restorative system showed lower shear bond strengths. Clinical evaluation should be done for assessing the clinical success of silorane based restorative system.

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Twenty years of children's dental programme in Osakidetza, Basque health service

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Introduction: In 1990 the Basque Government implemented a dental assistance service for children. They carried out the fluoridation of the water, which covers 75% of the population, and they started a good quality system of dental assistance for children.

Aim: The aim of this health politics is that children grow up in good health, and in that way the CAO index caries will get reduced.

Design: The basis of the programme is to ensure a minimum and basic dental service for children between seven and fifteen years. This service includes regular checkups, sealing of fissures, fillings, and endodontic treatments. The temporary detection treatments and orthodontical treatments are also excluded. A board of general practitioner dentists has been formed, the majority of whom are dentists of the private sector who have been employed for that aim, together with dentists of the public sector.

Results: In the epidemiological research of 1988, 17% of the fourteen year old children's teeth were free from caries in their permanent dentition. In the research of 2008, 61% of the children of this age were free from caries.

Conclusions: The dental health of our children has remarkably improved in the last twenty years, and this has been a direct consequence of the proper assistance of the general practitioner dentists.

P14-238

Attitude and beliefs of traditional birth attendants to prematurely erupted teeth in infants, in urban local government areas in Ibadan, Nigeria

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Background: Traditional birth attendants (TBA's) are part of the obstetric team throughout the developing world and can be invaluable in assisting to dispel myths commonly associated with natal/neonatal teeth. To ensure correct delivery of the message, base line data of their beliefs is important.

Aim: To assess the attitude and beliefs of some Nigerian TBA's for prematurely erupted teeth in infants.

Design: A cross sectional survey was conducted among a randomly selected sample of 163 Traditional Birth Attendants from the five urban Local Government Areas in Ibadan, Nigeria, using an interviewer administered questionnaire.

Results: Natal/neonatal teeth, cause fear and shock to 35.6% of the TBA's whilst 46% of them regard those teeth as a variation that

sometimes occurs. Perceived causes of the variation include evil spirits (31.9%), cultural taboos (9.2%) and prolonged gestation (4.9%). Beliefs on the effect of natal/neonatal teeth on the child include strange behavior (31.3%), child developing evil spiritual powers (41.1%) and retardation (3.1%). Practices towards this variation included advising parents to abandon or hide the child (4.9%) and immediate extraction of the teeth with/without sacrifices (35.6%). There was a strong association between the negative beliefs and age ($P = 0.001$) and education ($P = 0.008$).

Conclusions: Dangers of TBA's in such an ignorant state are that wrong counsel may be given to parents and affected children may be neglected, stigmatized and exposed to danger. There is an urgent need to address knowledge gaps by giving health education to this group of people.

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The effect of different models of oral health education programs on adolescents

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Background: Oral health educational programs are usually aimed at primary schoolchildren, but their effects on adolescents are not clear enough.

Aim: to study the effect of different models of oral health education programs on adolescents.

Design: Knowledge and habits in oral health were studied in a group of 1951 16-year-old schoolchildren. Among them 985 children (the 1st group) were educated in grades 1–3 by schoolteachers according to an Oral Health School Program, 736 (the 2nd group) were not. 230 children (the 3rd group) were educated by schoolteachers (as in the 1st group), then in 5–10 grades by a dentist according to a Special Oral Health Program for Adolescents. Dental examination was conducted in randomly selected samples: 317, 289, and 103 adolescents from the 1st, 2nd, and 3rd groups., respectively. The differences were assessed with Student-t test.

Results: The adolescents of the 3rd group were superior to the 1st and the 2nd groups in tooth brushing frequency (two daily brushings 86.1%, 58.8% and 44.6%, respectively), floss use (80.9%, 59.8% and 58.5%, respectively), dental office attendance for preventive purposes (81.3%, 65.7% and 35.0%, respectively), and absence of dental phobia (75.7%, 63.4% and 10.8% respectively). Oral health in the adolescents of the 3rd group was significantly ($P < 0.01$) better than in the 1st and the 2nd ones: OHI-S – 0.63 ± 0.27 , 1.88 ± 0.13 and 2.80 ± 0.15 , DMFT – 3.12 ± 0.14 , 4.25 ± 0.11 and 4.51 ± 0.09 respectively. No difference was revealed in diets: most (97.6%–99.2%) children in all groups consumed sweet foods and drinks frequently.

Conclusion: Schoolchildren need educational programs from grades 1 to 10 for significant improvements of oral health in adolescence.

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Oral health knowledge: a survey of health teachers in public primary schools in Lagos State, Nigeria

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Background: A large proportion of decayed teeth are often left untreated amongst Nigerian children resulting in pain. Teachers are known to exert influence on their pupils and to an extent on their pupils' parents.

Aim: To assess the oral health knowledge and oral health related practices of health teachers in public primary schools in Lagos state.

Methods: A cross sectional survey of a group of health education teachers in Lagos state public primary schools was done using a self administered questionnaire. One health teacher was randomly selected from each of all the 1050 public primary schools in the state. The questionnaire assessed their socio-demographic characteristics; knowledge on cause and prevention of common dental diseases; importance of the human dentition as well as their oral hygiene and health practices. Individual informed consent was obtained. Data analysis was done using SPSS statistical analysis package version 17.0.

Results: A total of 609 Health-education teachers participated (response rate 58%) with age range 23–59 years (mean-45.99 ± 5.99 years). The majority was female (82.4%). A total of 72.9% reported receiving teaching on oral health and 95.4% reported teaching their pupils about oral health care. However, only 15.1% displayed good oral health knowledge. Over half (57.3%) never had a previous dental visit and only 33.5% floss. Toothache was the commonest complaint from their pupils.

Conclusion: Though the majority of the teachers taught the children about oral health, very few displayed good knowledge and practice. Hence, health-teachers may benefit from oral health education in order to promote oral health in their pupils.

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Utilization of the early dental screening program in Germany

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Background: Since 1999 the German health care system offers an early dental screening program ('FU') consisting of three examinations. The first should be performed generally in the 3rd year of life. The two further examinations should take place up to the completion of the 6th year, whereby the interval between them must amount at least 12 months.

Aim: To determine the portion of children who utilized these FU-examinations.

Design: Records of the years 2008 through 2009 of the associations of statutory health insurance dentists of German states were analyzed for charged FU-positions. These data were stratified for the patient's age. The number of FU-examinations was correlated with the population-statistic data after adjustment regarding the portion of privately insured children [approximately 8.3%].

Results:

State	Year	Portion of children with whom FU-examinations were charged (arranged according to their year of life) (%)			
		3rd	4th	5th	6th
Baden-Württemberg	2009	28.5	34.7	35.6	15.9
Bavaria	2009	25.0	33.0	35.0	29.4
Berlin	2008	13.6	26.5	29.4	28.7
Brandenburg	2008	22.8	28.6	29.9	24.4
Bremen	2009	18.3	28.7	32.4	30.4
Hamburg	2009	16.5	30.6	33.5	33.8
Lower Saxony	2009	21.7	28.2	30.3	24.5
Saxony-Anhalt	2009	31.4	34.9	34.3	15.6
Westphalia-Lippe	2009	17.4	25.2	27.2	22.6
Mean value		21.7	30.0	32.0	25.0

Conclusions: Numerous publications over prophylaxis programs prove that an early dental visit of the child clearly reduces the occurrence of caries. In order to achieve a further decrease of caries incidence in primary dentition, serious measures are demanded, which contribute to a substantial increase of the early dental screening examinations in Germany.

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Use of art in children from 3 to 7 years of riparian communities in the Amazon – state of Amapá, Brazil

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Introduction: Atraumatic Restorative Treatment – ART was introduced in dentistry by Frencken in the 80's, in African populations, as an alternative model of care, in places with no minimum conventional infrastructure, which continue to have a generalized picture of poor oral health. When equipment such as high or low speed and aspiration is available, it is called modified ART.

Case report: ART has been seen by the World Health Organization as an extremely viable alternative for poor people, especially in developing countries (Basic Package for Oral Care, 2008). Brazil is a country where large territories, even with a high number of pediatric dentists, where one can still find places with little or no dental care for children, as is the case with some riparian communities in the Amazon. This work demonstrates the application of ART in children 3 to 7 years old, in riverside communities of the State of Amapá, north of Brazil, which have a high rate of carious lesions and lack of infrastructure for conventional dental treatment.

Comments: The use of ART in children in riparian communities, associated with educational and preventive techniques, has initially shown to be effective because it allows a low-cost dental care in places of difficult access and high disease prevalence, reducing the occurrence of pain and indications for extractions. It is welcomed by patients, but monitoring is necessary.

P14-243

An evaluation of topical fluoride uptake in primary schoolsA. TSICHLAKI¹, J. GALLAGHER² & A. PAU²¹*Department of Paediatric Dentistry and Dental Public Health, King's College Hospital NHS Foundation Trust, London, UK;*²*Department of Oral Health Services Research and Dental Public Health, King's College London Dental Institute, London, UK*

Background: Research evidence suggests that topical fluoride varnish (TFV) is efficacious in preventing dental caries in clinical settings, but its delivery in community settings has rarely been reported.

Aim: To report on a pilot project of TFV in primary schoolchildren in inner-city boroughs of London and explore parents' views on the initiative.

Design: Primary schools were targeted based on caries prevalence, area deprivation, obesity status, academic performance and free school meals. Positive consent was required for dental inspections (DI) and TFV. Data were collected on numbers receiving DI and TFV as part of a wider oral health program. Parents' views on the school program were obtained through follow-up telephone interviews, where parents participating in the program had provided consent to be contacted and focus groups conducted at schools.

Results: Of the 4 656 eligible children aged 4–11 years in 12 schools, 3 129 (67%) were inspected, and 2 137 (46%) received TFV, an average of 180 per school. Reasons for non-uptake included missing consent forms and medical contra-indications. Provisional findings from 31 parent interviews indicated that most parents who participated thought it was a 'good idea' to have fluoride varnish applied on their children's teeth. Parents, both participants and non-participants, wanted to know more about the role of fluoride in preventing disease and strongly supported oral health activities in schools from dental inspections to oral health promotion.

Conclusions: This study raises the challenges associated with conducting TFV programmes in inner-city schools. It highlights that further work is required to inform and support parents.

P14-244

Medical procedure codes icd-9 cm performed on children and adolescents in the dental specialist centre, Medical University of Gdańsk in Poland

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Introduction: In Poland, since 1999 National Health Fund covers dental services described as medical procedure codes in ICD-9 CM from public funds for children and adolescents. For 54 years dental care funding from the state budget, has been replaced by public funds, hence the need to analyze dental procedures structure.

Aim: Analysis of cases based on dental documentation, and standardized computer programs, can be used to optimize oral health operations.

Design: Dental documentation for 952 patients under 18 years of age, 432 girls and 520 boys were analyzed for 40 types of dental services with the nomenclature of ICD-9 CM. Inference was based on *statistics*.

Results: The prevention of dental caries: tooth 36 was most often sealed in girls 32.08% and 28.30% in boys. Fluoride *varnish* application in girls 54.09%, in boys 45.91%. In the treatment of dental caries tooth 84 was most often filled, similarly in both sexes. Tooth 21 was mostly reconstructed in girls, while in boys tooth 11. Endodontic treatment for the three canals was performed in 19.18% of girls. In boys, 20.27% was dead tooth trepanation. Removal of *dental calculus* two times more often in girls. Control exams, extraction, and anesthesia was similar in both sexes.

Conclusions: The Structure of dental services developed very unfavorably, 50% were caries treatment while prevention only just over 5% of the procedures. Results suggest the late start of prevention and the need for expensive treatments.

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Socio-economic status and schools oral health promoting programG. QADRI¹, M. FRANZE² & C. SPLIETH²¹*Al-Hada Military Hospital, Saudi Arabia;* ²*Greifswald University, Germany*

Aim: To evaluate the effect of an oral health promoting program in relation to socio-economic status (SES), implemented in primary schools of the Pomerania region/East Germany.

Design: This program was part of an innovative multidisciplinary general health promoting program, a longitudinal collaborative project based on health competence. Seven hundred and forty students with an age range 9–12 years (mean 10.34, SD ± 0.56, 48% females) were recruited from the fifth grade students of 18 different primary schools. The schools were randomly allocated into two groups. Oral health education was provided to the teachers in the intervention schools and then they conveyed it to their own students, while no additional measures were conducted in the control schools. Medical and compulsory dental school examinations as well as questionnaires for the students and their parents were conducted at baseline and after one and half year of the program.

Results: A significant correlation between caries increment and intervention/control group was reported, with a 35% higher risk in the control group. High SES has a beneficial effect in the intervention group with a reduction in incidence risk ratio of 94% ($P < 0.001$). While no preventive effect could found in the low SES group.

Conclusions: The implemented program was effective in improving dental health, especially among high SES students, but failed to achieve an effect in the low socio-economic group. Social inequalities are an important issue which was partly tackled with a competence-based program, therefore, an additional behaviour-centered approach should be seriously considered.

P14-246

The changes of dental health care of boarding school children in three years

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Background: The children who are staying in boarding schools away from their family have some difficulties to reach dental services.

Aim: The aim of this study was to reach and give dental services to the boarding school students in their own environment and to investigate the changes of dental health care within 3 years.

Design: A boarding school which is positioned in a small village 300 km away from Izmir was visited in 2006 and 2009. 70 children who are staying at the school were examined and questioned about oral hygiene habits, frequency of dental appointments and preventive treatments. DMF and df indices were recorded according to WHO criteria.

Results: The oral hygiene of the children have progressed and this change was statistically significant. The frequency of tooth brushing was mostly increasing. The frequency of dental appointments improved in 38% of the children. All of the children had been given oral health motivation. DMFT and DMFS scores were significantly higher in the second visit. D, also F components were significantly higher. df and dfs scores were significantly lower in the second visit. Where the number of decayed teeth were decreasing, the number of teeth with fillings had increased. A total of 87 teeth were restored or extracted. Seven children who didn't accept any treatment at the first visit, could be treated at the second one.

Conclusion: While there is a governmental hospital 8 km away from the school, we have been more successful by treating the children in their own school.

P14-247

Dental health inequalities of 11-year-old children in Edinburgh (Lothian), UK

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Background: Tooth decay remains a common health problem in developed countries, especially linked to socio-economic deprivation.

Aim: The aim of this study was to quantify both the overall levels of dental health in 11-year-old children in Edinburgh (Lothian), UK and to calculate the level of dental health inequalities in order to act as a baseline for evaluating future action.

Design: A random probability sample of state schoolchildren in the Lothian Health Board area was examined. Residential postcodes were used to allocate children to areas ranked by deprivation. These areas were then stratified by quintiles (Scottish Index of

Multiple Deprivation). The Dental Health Inequalities Index (DHII) was calculated.

Results: A total of 1 337 children were included in the survey. The mean age was 11.5 years (males = 52%). The mean DMFT was 0.78 and 66.4% were free of decay experience (DMFT = 0). When stratified by SIMD quintiles, there was a strong linear relationship between deprivation and tooth decay. In the most deprived quintile, the prevalence of those free of decay experience was 51% progressing to 77% in the most affluent (R squared = 0.87, $P < 0.05$). The DHII was 0.47.

Conclusions: School dental surveys can be used to measure the dental health inequalities gradient. There is a strong linear relationship between deprivation and tooth decay in Edinburgh. A baseline value for dental health inequalities has been established showing a large inequalities gradient. Future efforts to improve oral health should be designed to also reduce dental health inequalities.

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Trends in dental caries (1993–2010) among children in a rural region of NE-Greece

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Background: Within Greece caries indices are found worse in rural areas compared to the urban ones, while tracking of DMFT data by following the children for years is still limited.

Aim: To study trends of caries experience of school children living in a rural district of north-eastern Greece over a 17-year time span.

Design: Eight cohorts (~170 children each) from the age of seven and for six sequential years (~70% same children) were followed. Totally 48 cross-sectional caries registrations were carried out in the Public Health Centre by one dentist, according to WHO-1997 criteria. In the frames of the implemented preventive program, fissure sealants to newly erupted molars since 1997 and fluoride applications to caries affected children since 2003 were introduced. **Results:** Although all cohorts started with a DMFT ≤ 0.18 in the age of seven, steadily lower incremental rates till the age of 12 have been revealed over time. Since 2005 the decline of caries scores almost levelled out. Caries prevalence among 12 year-olds went down from 62% (1998) to 22% (2010) as caries (cavity) free children were almost doubled in all age groups. *1st cohort* (1993–1998): No sealants & DMFT of 12 year-olds was 1.91(SD \pm 2.28). *3rd cohort* (1997–2002): Sealants 2–4/child & DMFT of 12 year-olds was 1.16(SD \pm 1.63). *8th cohort* (2005–10): Sealants 3–4/child plus fluoride applications & DMFT of 12 year-olds was 0.41(SD \pm 0.87).

Conclusions: Evidence of downward trends in prevalence and severity of caries has steadily taken place. Thus, children under organized dental care and prevention can enjoy good oral health even in rural regions.

P14-249

Portable dental chairs and their role in assisting the community outreach program

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Background: Dental units need to connect to water and air and a discharging system. Little is known about the use of portable dental units/chairs used in remote areas with far to reach communities.

Aim: To describe the positives and negatives in using portable dental units in remote villages in and around Fareydoon- shahr (Isfahan, Iran), via interviews of operating dentists.

Method: Qualitative semi-structured interviews were conducted by one interviewer, who consulted seven dentists, two specialists, and 11 final-year dental students. The results of the qualitative research methods helped as a precursor for a future quantitative study.

Results: The Qualitative data was primarily concerned taking into consideration note of the range of ideas which the interviewers distinguished as relevant when describing the portable dental units. The predominant view most noted within interviews was that the portable units are very useful for the community outreach programs including two subcategories serviceability and access to oral health. Other factors mentioned about the portable unit were the competence of the operators unit and factors affecting each individual patient.

Conclusion: A number of significant variables, will have been found that they will help enhance the overall function of the Portable dental units. Portable dental units make it possible for the deprived to receive the care they deserve and should be implemented in more areas across the entire world.

P14-250

Parenting style and oral hygiene in adolescentsV. BRUKIENE¹ & J. ALEKSEJUNIENE²

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Aim: To test if variations in oral hygiene levels in adolescents are associated with parenting styles (PS) after controlling for background factors.

Design: The study was performed after receiving the permission from the Bioethics Committee of the Ministry of Health of Lithuania and written consent obtained from both adolescents and their parents/guardians. The sample comprised a total of 336 of 12–13-year-olds from three randomly selected secondary schools. The structured questionnaire included demographic characteristics, toothbrushing frequency and The Authoritative Parenting Index (API) for assessing PS. An Individual Quantitative Plaque% Index (IQPI) was used as a clinical outcome measure. Factor Analysis was used for API scales to study the relationships among

interrelated variables. For bivariate comparisons an Independent Sample t-test or one-way ANOVA with *post hoc* Bonferroni adjustment was applied. Linear Multiple Regression (LMR) was employed to evaluate the joint associations between different independent variables and the outcome measure.

Results: Although the specific PS of mothers and fathers were related (e.g. Mother Authoritative and Father Authoritative $r = 0.466$; $P = 0.000$), these variables did not associate significantly with IQPI. In the bivariate analyses, socio-economic status (SES) ($P = 0.012$), number of children in the family ($P = 0.003$), and frequency of toothbrushing ($P = 0.001$) were related to dental plaque levels. In the multivariate analyses, the final LMR model was significant ($P = 0.005$), but only 'SES' and 'toothbrushing frequency' were statistically significantly related to the IQPI.

Conclusions: Only SES and toothbrushing frequency explained variation in dental plaque levels among adolescents. The expected relationship between PS and oral hygiene levels was not confirmed.

P14-251

Dental fluorosis and caries prevalence among 9–13 year old school children residing in an industrial aluminum plant areaA. MENTES¹, S. GUNER¹ & B. MERAKLI²

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Background: Fluorides in several metals and nonmetals are important industrial chemicals, used for aluminum production.

Aim: The purpose of this study was to assess the dental fluorosis and dental caries in children living in an area polluted by the wastes from an aluminum plant in a town 'Seydisehir' which is located in the central Anatolia.

Design: Two hundred and four (92 girls-112 boys) children resident of the area aged between 9 and 13 year old were examined. Dental fluorosis was assessed by TF index and dental caries were scored using DMF-T index. The drinking water and waste-water samples were collected from the same area and F-content of the samples were analyzed by Fluoride Ion Selective Electrode.

Results: Only 16 out of 204 children had questionable enamel defects. Sixty-nine children (33.8%) were caries-free and DMF-T of the group was 2.73. Fluoride content of tap water collected from schools and local fountains were between 0.01 and 0.08 ppm whereas the red mud lake of the plant had 119 to 275 ppm and a river passing through the city had a level of 1.21 ppm of fluoride.

Conclusion: The results from the polluted water samples showed elevated fluoride levels in the aluminum plant area. Since the degree of dental fluorosis was negligible in children living in the area we concluded that the decontamination of drinking water had been done accurately and follow-up monitoring should be continued properly.

P14-252

Development and evaluation of extension course in atraumatic restorative treatment (ART) using distance education

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Background: The first step to introduce Atraumatic Restorative Treatment (ART) to a health system is training dental professionals.

Aim: Develop and evaluate an extension course in ART based on distance learning (DVD format).

Methods: The course involves computer graphics, clinical films and interviews. The sample consisted of 68 dentists from public health system of São Paulo assigned into two groups: Diadema Group - 44 professionals of Diadema city (dropout 17%) and USP Group - 24 professionals from seven cities involved in a partnership with Pediatric Dentistry-FOUSP (7.7% dropout). They answered an initial questionnaire and underwent an assessment process before and after the course.

Results: Tests corrections were performed by two researchers (inter-examiner ICC = 0.970; intraexaminer ICC = 0.991). The groups showed increase of knowledge after the course (Student's paired t test $P < 0.05$). In the multiple linear regression model, considering initial grades, association was observed for professional over 46 year olds ($\beta = -0.807$, $P < 0.01$), participants that had in mind that ART was a definitive treatment ($\beta = 0.581$, $P < 0.01$) and dentists with reduced clinical experience ($\beta = -0.592$, $P < 0.05$). When considering the final grades, there was an association for Diadema group ($\beta = -0.652$, $P < 0.01$), women ($\beta = 0.700$, $P < 0.05$), professionals over 46 years old ($\beta = -0.788$, $P < 0.05$) and participants who pointed out ART as a definitive treatment ($\beta = 0.515$, $P < 0.05$).

Conclusion: Distance education has the potential to promote the skills to perform correctly ART. Besides, young adults and females, with appropriate basic knowledge and interest in professional development improve the students' performances on distance education.

P14-253

Dental health education and preventive treatment program of public school children (aged 7-12) in Kadikoy Region, Istanbul, Turkey. 'Health to our children's smile'

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Aim: The aim of the program is to educate children, parents and teachers, increase the dental health quality of primary school children, follow up patients, observe the results of treatments and educations, enhance children's brushing habits and increase oral health knowledge of the parents.

Design: Kadikoy is one of the districts of Istanbul with a population of 553 000 people. Kadikoy Municipality has been carrying out 'Oral and Dental Health Screening and Preventive

Dentistry Days Project'; in the purpose of solving the prevalent problems, giving dental health education and improving the traditional nutrition habits according to 'healthy life standards'. Kadikoy Municipality has been carrying out 'Oral and Dental Health Screening and Preventive Dentistry Days Project'. The project aimed 78 000 student in 80 public primary school for oral hygiene and healthy nutrition education and preventive and conservative dentistry treatments. After clinic and radiological examinations, all treatments and preventive dentistry applications are done without cost. Children who require orthodontic treatment are guided to related clinics or faculties. All patients are being dialed up every 6 months and 1 year recalls in order to observe the results of treatments and educations.

Results: The program includes use of restorative materials, sealants and fluoride, plaque removal, careful food choices and regular dental care. Up to now, 66 480 fissure sealant applications were done in 21 353 children. 43 680 composite fillings, 8 778 amalgam fillings, 10 978 extractions, 15 286 preventive resin restorations, 3 239 amputations, 3 815 GIC fillings, 2 275 root canal treatments, 45 046 fluoride applications were done within 4 years (2007-2011).

Conclusion: The program gave promising results up to now, we also observe that it was effective in decreasing plaque and gingivitis scores. We hope for a caries free generation in the future.

P14-254

Oral health status of women with normal and high-risk pregnancies

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Background: Poor oral health during pregnancy can be a risk factor of birth complications and early childhood caries.

Aim: The aim of the study was to compare the oral health status of women with normal pregnancy and those with high-risk pregnancy.

Design: A total of 142 women in the third trimester of pregnancy were randomly selected for this study. The pregnant women were divided into two groups: a normal pregnancy group (A) and a high-risk pregnancy group (B). The following variables were recorded for each women: age, general health status, DMF index, CPITN index, PBI index, amount of *Streptococcus mutans* in the saliva and dental plaque, buffering capacity of saliva and dental treatment need. The Mann-Whitney test, Kruskal-Wallis test, two-sided t-test and chi square test were used for statistical analysis.

Results: Women with high-risk pregnancy showed increased values in all measured indices and tests. Statistically significant differences were detected between the two groups for the PBI index and dental treatment needs.

Conclusions: The study supported the hypothesis of an association between oral health and course of pregnancy. Women with complications during pregnancy had severe gingivitis and needed more dental treatment than women with normal pregnancy. Supported by grant IGA Health Ministry of Czech Republic NS 9732-3.

P14-255

Parental attitude to reversal of eruption sequence in NigeriaO. DENLOYE¹ & M. OSUH²¹*Department of Child Oral Health and* ²*Department of Periodontology and Community Dentistry, Faculty of Dentistry, University College Hospital, Ibadan, Nigeria*

Introduction: Tooth eruption is a normal physiological process with variations in sequence of eruption occurring in some children. Occasionally a reversal of the process whereby the upper central incisors erupt ahead of the lower central incisors may occur. In some communities there are negative society beliefs and attitudes to such reversal in eruption sequence. The purpose of these case reports is to document a negative parental attitude to such reversal of eruption sequence in Nigerian children.

Case reports: Babies J and S were 21 and 15 months old children whose mothers at different times brought for the extraction of teeth 51 and 61 because they erupted earlier than their lower counterparts and both mothers were informed by older family members that their children had some supernatural powers. Baby J's mother was further informed that her husband who lived away from his family and had not seen the child since the eruptions would die within 7 days if he sees the child. Counseling sessions were organized for both mothers at different times. While baby J's mother attended twice before she was lost to follow up only to reappear a year later with the child having his teeth 51 and 61 missing, baby S's mother never attended the counseling session and health workers who visited them at home and observed that the upper central incisors were missing were sent away.

Comment: These are cases of out of sequence eruption pattern with a negative cultural implication that may need transcultural approach in its management.

P14-256

Physicians' willingness to receive oral health information in Iran

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Background: The integration of oral health promotion into general health care has been highly recommended.

Aim: The purpose of this study was to assess physicians' willingness to receive oral health information as well as the main sources of this information.

Design: This cross-sectional study was carried out among the participants of the major Annual Congresses for General Physicians in Tehran, Iran in 2010. Data were collected by means of a self-administered questionnaire on physicians' backgrounds, their self-perceived oral health knowledge, sources of information and their willingness to receive oral health information. Statistical analysis was carried out with Chi-square tests.

Result: Among the 388 physicians (45% men and 55% females) who answered the questionnaire, 39% reported that the main source of oral health information was their undergraduate curriculum. However, 22% believed that they have not been educated in this field at all. Among the physicians, 99% believed that they need to be knowledgeable about oral health and 72% were willing to be trained in this field. From the physicians 54.4% reported the need to know more about pediatric dental care in particular. No gender difference existed for the above figures.

Conclusion: Results showed a lack in oral health training and consequently insufficient knowledge among physicians, as they reported it. Regarding their strong willingness to receive oral health information, it seems beneficial to educate them in promoting oral health.

P14-257

Effects on health behavior of an individual tooth brushing intervention in school-children— a questionnaire based surveyH. HALONEN¹, L. SEPPÄ¹, R. KILPELÄINEN¹, E. PELTONEN², L. TJÄDERHANE¹ & V. ANTTONEN¹¹*University of Oulu, Faculty of Medicine, Finland;* ²*Health-care center of Laukaa, Finland*

Background: Finnish school-childrens' tooth brushing frequency is one of the lowest in Europe. It has been shown that children can improve their oral health-related behavior by intervention.

Aim: The aim of this study was to evaluate the effect of a health intervention ('tooth brushing school') on school-childrens' oral health behavior.

Design: Tooth brushing school was piloted in a mid-sized Finnish city, in which 7–13 year-old school-children were assigned in intervention ($n = 574$) and control ($n = 611$) groups according to their school. In 2008, children in the intervention group received individual tooth brushing education by a dental assistant. Parents were present in teaching sessions. In 2009, all children answered a questionnaire on their oral health behavior.

Results: There was no significant difference between the intervention (60.3%) and control (61.9%) groups in self-reported tooth brushing frequency (at least twice a day). Almost 15% of the children in both groups flossed their teeth at least weekly. Children in the intervention group got significantly more often parental help (54.4%) in tooth brushing than children in the control group (45.6%) ($P = 0.031$). Similar trend was seen for use of xylitol products (n.s.).

Conclusions: Tooth brushing and flossing frequency of the children studied was well above the national average in both groups, probably due to a long tradition of oral health education in the community. However, children in the intervention group received more often parental help, which may improve quality of oral hygiene and provide long lasting benefit for the child.

P14-258

Evaluation of theoretical and practical education of MTA manipulation for dental students in Iran

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Background: Mineral trioxide aggregate (MTA) is a material used to fill the root canals of teeth as part of root canal therapy. It has the ability to promote hard tissue formation similar to calcium hydroxide. Also both have similar biological and histological properties.

Aim: The purpose of this study was to find out the clinical application and the attitude towards MTA among Iranian dentistry students.

Design: According to the descriptive design, 487 subjects, who were senior students at the dentistry faculties of Iran, were selected by simple randomized sampling. A questionnaire, which consisted of two parts, was prepared to record demographic characteristics, clinical application and attitude towards MTA. The face and content validity methods was used to confirm validation of the questionnaire. Cohen's kappa coefficient was used, as a statistical measure of inter-rater agreement for qualitative items. Kappa coefficient was acceptable (0.8). The final questioner consisted of 13 items used to collect the data, which were analyzed using SPSS software, Ver.13.5.

Results: The sample consisted of 50.9% female and 49.1% male. From the students, 93.2% believed it is necessity to have theoretical education on MTA and 92.6% to have practical education on its use. In five dental schools, this material was used in the departments of endodontics, pediatric dentistry, restorative and prosthodontics. The students use MTA for pulp capping and pulpotomy procedures as well as endodontic surgical procedures. In 14 faculties, students use MTA for pulp capping and endodontic therapies in teeth with open apex and in 16 faculties, this material is used for treatment of root perforations.

Conclusions: The results of this study indicate the need for theoretical and practical education in the curriculum of Iranian dentistry faculties.

P14-259

Relationships between sense of coherence and attitudes towards oral health behaviors in adolescents

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Background: Higher Sense of Coherence (SOC) is associated with positive health habits, including tooth brushing in adults. In one study, no relationship for tooth brushing was found for 15-year-olds. Because SOC may still be developing in adolescence, it is important to study adolescents of all ages. Furthermore, little is known about the relationships between SOC and adolescents' attitudes towards their oral health behaviors.

Aim: To explore relationships between age, SOC, and adolescents' attitudes towards oral health behaviors.

Design: one hundred and twenty three adolescents, aged 12–18, in the Seattle area, completed the SOC questionnaire, the Dental Neglect Scale (containing items on oral health behaviors), and stated whether they go to the dentist.

Results: Overall, age was not related to SOC. Adolescents with higher SOC were more likely to go to the dentist, consider their dental health important, receive the dental care they thought they should, brush their teeth as well as they thought they should, and keep up their home dental care. The relationships for going to the dentist and considering dental health important, were stronger for younger adolescents, while the relationships for receiving dental care and tooth brushing were stronger for older adolescents. The relationship for keeping up home care was not related to age. There was a trend for those with lower SOC to postpone necessary dental care; the trend was stronger for younger adolescents. There was no relationship between controlling snacking and SOC.

Conclusions: Relationships between SOC and attitudes towards different oral health behaviors vary by adolescents' age.

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P14-260

DNA detection of cariogenic and periodontal pathogens in the saliva of infants

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Background: Improved microbiological methods suggest that acquisition of pathogens associated with caries and periodontal disease occurs earlier than previously appreciated. The presence of these microbes can represent a risk factor for early childhood caries and early onset periodontal disease.

Aim: The aim of study was to identify known cariogenic and periodontal pathogens in the saliva of six months- and twelve months- old infants.

Design: Fifty-eight six months- old healthy prenatate infants (group A) and 45 twelve months- old healthy infants (group B) were randomly selected into our study. Samples of the saliva from dorsal mucosa of tongue and alveolar mucosa were used for detection of cariogenic and periodontal pathogens. Bacterial species were identified using PCR based method (test Stoma Gene®, Czech Republic).

Results: The cariogenic microbes (*Streptococcus mutans*, *Lactobacillus* spp., *Actinomyces* spp.) were the most frequently isolated bacteria in both groups. 96.6% of infants in the group A and all infants in the group B had some species of cariogenic microorganisms (mainly *Streptococcus mutans*) in saliva. The periodontal pathogens (*Aggregatibacter actinomycetemcomitans*, *Prevotella intermedia*, *Fusobacterium nucleatum*) were found in saliva of 63.8% six months-old infants and of 95.6% twelve months-old infants.

Conclusions: Our findings have confirmed early acquisition of cariogenic and periodontal pathogens to oral cavity of six months and twelve months- old infants. These pathogens may occur in the oral cavities of infants prior to tooth eruption.

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P15-261

Multidisciplinary approach in excision biopsy papilloma removal with Lite Touch ER:YAG laser in pediatric dental patient

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Introduction: Laser technology has a wide application in pediatric dentistry. Papilloma lesions represent 2.9% of all oral mucosa lesions. Papilloma squamosa is a benign exophit epithelial lesion. The proliferation of squamous cells is caused by papilloma human virus. It is usually presented as a single lesion but multiple lesions can also be developed. Most commonly affected places are the tongue, lips and soft palate.

Case report: A 4-year-old boy presented with a 4-mm round, firm, pink sessile mass inside of his lower lip. The parents stated that the child bit his lip and the 'bump' had gotten bigger as he repeatedly bit his lip. The 2940-nm Er:YAG (LiteTouch, Syneron Dental Lasers, Israel) laser was used with a 0.8 × 14 mm tip 'biopsy' program to dissect out the fibroma from its periphery. There was no bleeding, the patient felt no discomfort, and no sutures were necessary. The patient returned for a seven-day after recall appointment, and a photo of the treated area was taken. The area appeared smooth and free of any recurrence.

Comments: The advantage of laser surgery includes higher precision when compared to surgical tools, which results in less pain, bleeding, swelling and scarring. The great advantage of Er:YAG laser excision biopsy is the fast postoperative recovery. Dental lasers can be integrated with conventional therapies, influencing and improving the positive acceptance of pediatric dental treatment.

P15-262

Familial adenomatosis polyposis – oral and maxillofacial manifestations – case report

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Introduction: Familial adenomatous polyposis (FAP) is an autosomal dominant hereditary disease, which is characterized with presence of numerous adenomatous polyps in the colon and rectum. If left untreated and the polyps are not surgically removed on time, inevitably one or more of the above polyps will progress to colorectal carcinoma. Main oral manifestation, which is diagnosed

frequently during radiographic examination accidentally in children, before the initiation of orthodontic treatment, is the presence of supra-numerous tooth or teeth (especially premolars and mesiodentes), presence of odontomas and osteomas.

Case report: This case report describes a seven year old girl that was sent to our department by an orthodontist, asking us for removal of mesiodent before the orthodontic therapy. The radiographic examination confirmed the presence of one mesiodent. Detailed medical history was taken and it was revealed that the grandfather (from the mothers' side) had passed away due to colorectal carcinoma. Subsequently molecular – biological examination from peripheral blood was performed, and was confirmed substitution gene mutation on 5th chromosome of gene APC (p. V1822D). This mutation was confirmed after similar genetic examinations in mother and brother of the patient. The results of clinical and endoscopic examination are presented in this study.

Comments: Effective cooperation between specialized practitioners is often proved crucial for patients' health. Early diagnosis and treatment of syndromes, as FAP, is necessary for preventing the life threatening progress of the disease. Dentists' role is important in on-time diagnosis of the above disease.

P15-263

Multiple impacted teeth associated with large follicular cyst: a case report

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Introduction: The missed eruption of a tooth can be due to presence of supernumerary teeth, odontomas or a cysts. The removal of the lesions is mostly surgical and allows lesion removal and orthodontic anchorage of the impacted permanent tooth, but often results in a large loss of bone and consequent periodontal damage. This case report aims to present a non invasive surgical treatment (and the simple application of orthodontic traction force) enough to permit the eruption of a permanent tooth, allowing, at the same time, the integrity maintenance of the periodontal tissues.

Case report: A 10-year-old boy, in the mixed dentition stage, presented multiple impacted teeth associated with a large follicular cyst in the right mandibular region. Clinical examination revealed the absence of the lower permanent lateral incisors while radiograph showed a large follicular cyst which displaced first premolar, canine and lateral incisor germs. Treatment included the ultraconservative surgical removal of the cyst and application of orthodontic traction force after the surgical exposure of teeth. The fixed appliance was used to preserve the space of the missing teeth. Follow-up 4 months later showed implicated teeth erupted.

Comments: The removal of the cyst was followed by an excellent healing without excessive loss of bone or periodontal damage. The orthodontic extrusion permitted a correct and rapid eruption of teeth which would have been inevitably impacted.

P15-264

Lichen planus in a child with vacterl association and T-cell lymphopenia

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Introduction: Lichen Planus is a chronic inflammatory disease of skin and mucous membranes. Although it is common in adults, particularly middle-aged women, cases in childhood are rare. The aetiology is uncertain but multiple factors have been implicated including genetic disposition, infective agents, systemic disease, autoimmune disease, drug reactions and hypersensitivity to dental materials. The pathogenesis is likely to involve T-lymphocytes triggering cell mediated immunological damage to epithelium, leading to chronic inflammation. Oral Lichen Planus presents as characteristic white striations affecting the mucosa with the possibility of inflammation leading to erythema and ulceration.

Case report: This case describes an 8-year-old boy of Pakistani origin who presented with oral white patches of 2-years duration. His medical history was of VACTERL Association (anomalies affecting Vertebral, Anal, Cardiovascular, Tracheo-Esophageal, Renal/Radial, and Limbs), T-cell Lymphopenia and developmental delay. Clinical examination revealed bilateral white striations on the gingivae, buccal and palatal mucosa and the ventral surface of the tongue. He also had an itchy, papular lesions affecting his neck, trunk and legs. A multidisciplinary approach involving paediatric oral medicine, dermatology and immunology has been established. Routine haematological and biochemical investigations were normal. A diagnosis of reticular oral lichen planus was made based on the classical clinical presentation. A skin biopsy confirmed Lichen Planus. Topical preparations have been successful in controlling the patient's symptoms. The patient remains under multidisciplinary review.

Comments: Lichen Planus is rare in children and in this case the patients immunocompromised state due to T-cell Lymphopenia is likely to be a significant predisposing factor.

P15-265

Radicular cyst: a radical complication of dental phobia

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Introduction: Radicular cysts, the most common jaw cyst in adulthood affecting the permanent dentition, are rare in children and adolescents. Children and adolescents with jaw cysts may present with facial asymmetry, intraoral swelling with a bluish tinge, loose/displaced teeth, pathological fracture, or paraesthesia of the inferior alveolar dental or infraorbital nerves. Treatment (non-surgical decompression/enucleation) depends on patient age, lesion size, adjacent structures, and associated teeth.

Case Report: A 14 year-old girl presented complaining of cheek swelling, persistent since an episode of facial cellulitis two years

prior. She had dental phobia and was unable to tolerate treatment in the dental chair. Examination revealed facial asymmetry affecting the right cheek, swelling of the alveolar plate in the 12/13 region, and a large unilocular radiolucent lesion with well-corticated borders centred on teeth 11, 12 extending to tooth 15 with displacement of teeth 11, 12 and 13. Under general anaesthesia the lesion was aspirated, enucleated, and root canals in teeth 11 and 12 extirpated, prepared and medicated. Histopathology revealed a cyst lined by stratified epithelium with inflammatory cell infiltrate consistent with a radicular cyst. Following enucleation she healed without complication and responded well to desensitisation; teeth 12 and 11 were treated endodontically under relative analgesia, local anaesthesia and desensitisation.

Comments: This case demonstrates a potential outcome of dental phobia and failure to address necrotic and infected teeth. Following enucleation under general anaesthesia, desensitisation allowed her achieve coping skills to undertake preventive, restorative and endodontic treatment in the dental chair.

P15-266

Nodular fasciitis of the upper labial mucosa: report of an unusual case with immunohistochemical analysis

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Introduction: Nodular fasciitis is a reactive psedosarcomatous process composed of fibroblasts and myofibroblasts. It usually affects the upper extremities with only 20% of cases involving the head and neck area. Oral localization is very rare.

Case report: A 16-year-old boy was referred to our clinic, for evaluation of an asymptomatic swelling of the upper lip present for the last 2 years without any significant changes in size. Clinical examination revealed a well-circumscribed, firm non-tender, 2 cm in diameter, soft tissue mass. The lesion was totally excised. Microscopic examination revealed a tumor-like lesion composed mainly of dense connective tissue containing spindle shaped cells with fibroblastic and myofibroblastic features, arranged in bundles and fascicles. The cells had oval, pale staining, vesicular nuclei with prominent nucleoli. Pleomorphism or atypical mitotic activity was not present. Giant cells and chronic inflammatory cells were scattered throughout, while areas of hyaline fibrosis were also discerned. Infiltration of the adjacent striated muscle fibers by lesional cells was noticed. Immunohistochemical examination showed the lesional cells to stain for smooth muscle actin and vimentin being negative for CD68, pancytokeratin, epithelial membrane antigen, ALK, CD34 and S-100. Ki-67 proliferation index was 3–5%. A final diagnosis of nodular fasciitis was rendered and the patient was placed on regular follow-up.

Comments: Nodular fasciitis may be confused with malignant and or benign aggressive mesenchymal lesions, leading to unnecessary radical surgery. Taken this under consideration this entity should be included in the microscopic differential diagnosis of oral spindle cell tumors.

P15-267

Dental presentation and management of a child with vitamin D deficiency and insulin -dependant diabetes Mellitus Type I

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Introduction: Type 1 diabetes mellitus (T1DM) is an autoimmune disease predominantly of juvenile onset. Recent evidence supports the role of Vitamin D (Vit D) in preventing diabetes. Vit D has been shown to modify T cell function. Receptors for its activated form were identified in both pancreatic beta cells and immune cells.

Case report: A 9 year old boy was seen in the Paediatric Dental Department. He complained of recurrent abscesses, repeated unsuccessful attempts at extraction due to anxiety and associated unstable diabetes. He was a poorly controlled T1DM with subcutaneous insulin pump and four hypoglycaemic episodes daily. He had Vit D deficiency (Vit DD) for which he received monthly VitD injections. On examination, the patient was in the mixed dentition with caries affecting all upper primary molars, associated buccal abscesses, caries in the lower second primary molars and delayed eruption. The treatment plan included restorations in the dental chair and extractions under general anaesthesia. Ground section of an extracted tooth demonstrated a tendency to tapered morphology and raised the possibility of Vit D resistant rickets. On review the patient presented with hypo-mineralised opacities affecting his left permanent incisors.

Comments: This case highlights the potential association between Vit DD and T1DM. As far as we know it is the first dental case of its kind reported. The incisor hypo-mineralisation and delayed eruption could be associated with Vit DD. Protocols should be introduced for these patients to be referred ab initio to the Hospital Dental Service as the dental treatment is challenging, requiring extensive liaison between different specialities.

P15-268

Treatment considerations in patients with Duchenne muscular dystrophy: a case report of two siblings with dental caries

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Introduction: Duchenne muscular dystrophy (DMD) is the most common form of muscular dystrophy with a typical onset in early childhood. The reported incidence is 1:3500–6000 live male births. DMD is an X-linked recessive disorder caused by mutations in the dystrophin gene. As a result the muscle-stabilizing protein dystrophin is absent or defective. On average the disease is diagnosed by 5 years of age and if untreated, the muscle strength deteriorates rapidly. With the disease progression respiratory, orthopaedic, and cardiac complications occur. DMD is currently incurable however,

with effective intervention patients will live beyond their fourth decade. Patients with DMD are treated with long term glucocorticoid therapy, as well as bisphosphonates and dietary supplements. Patients with this disorder often have altered craniofacial morphology and dental malocclusion and may have difficulty maintaining effective oral hygiene. Early preventive strategies are required to maintain effective oral health. If inhalational general anaesthesia is required for dental treatment, patients with DMD have the risk of malignant hyperthermia-like reactions and rhabdomyolysis.

Case report: Two siblings aged 6 and 8 years respectively attended for dental treatment. Both had widened dental arches and caries. The clinical management included restorative dental treatment, education on diet and oral hygiene and caries prevention programme tailored to the individual's needs and with consideration for the future progression of the DMD.

Comments: This case report outlines the complex nature of DMD and the special considerations that the paediatric dentists must be aware of for the provision of safe and appropriate oral health care for these patients.

P15-269

Malignant hyperthermia in a cerebral palsy patient treated under GA-a case report

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Introduction: Malignant hyperthermia (MH) is a rare life-threatening condition that is triggered by exposure to certain drugs used during general anesthesia. MH susceptibility is related to central core disease (CCD), an autosomal dominant disorder characterized both by MH symptoms and myopathy. It may lead to circulatory collapse and death if not treated quickly. This case describes a cerebral palsy patient who developed malignant hyperthermia during dental treatment under GA.

Case report: The patient was a victim of CP and came for full mouth dental treatment. Clinically, he was found to have poor oral hygiene and was suffering from many caries. Due to his CP as well as extensive dental destruction, treatment under GA was selected. After consulting the anesthesiologist, full mouth rehabilitation under GA was performed. However, the patient's body temperature and CO₂ pressure rose continuously during the first 30 min of anesthesia. Malignant hyperthermia was diagnosed. Dantrolene sodium was given immediately by the anesthesiologist and the fever subsided. After full mouth dental treatment was finished, the patient was hospitalized in ICU for observation. Patient was discharged after 1 week. No further complications were noticed. Patient has been returning every 3 months for cleaning and fluoridation.

Comments: In very rare situations that MH occurs during a GA procedure, immediate diagnosis and administration of dantrolene sodium is the key to saving the patient's life once MH begins.

P15-270

Dental care in teenager with special needs

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Introduction: According to the WHO, 10% of the population has some degree of disability, and three quarters of these do not receive dental care. They are rarely included in dental clinics where patients receive proper attention with local anesthesia, with collaboration and participation of children in the treatment.

Case report: Thirteen-year-old male patient, at social risk, institutionalised, with moderate mental retardation, taking carbamazepine and levomepromazine, rejecting dental care, with no data of previous traumatic experience, came to our clinic. The clinical diagnosis showed high risk for caries and periodontal risk; enamel dentin fracture of maxillary central incisor and absence of homologous tooth, superficial caries lesions, gingivitis, dysgnathia and parafunctional habits. A comprehensive and individualised approach was designed, with a strong preventive component. Patient received oral hygiene training, and initial risk indicators were reduced. Dental rehabilitation was carried out after an adequate motivation giving the patient a mirror to follow dental procedures. Then he was referred to the orthodontics unit, advising recall intervals every three months.

Comments: After further learning about the physical and intellectual condition of the patient, a positive patient-dentist relationship could be developed, reducing the anxiety during the visits. This favoured oral health re-establishment, self-care habits and improvement of self-esteem.

P15-271

Von Willebrand Disease (VWD): case report treated in a dental chair

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Introduction: VON WILLEBRAND DISEASE (VWD) is a congenital bleeding disorder, characterized by a complex hemostatic defect to prolong bleeding time and may be accompanied by a decreased factor VIII procoagulant activity. The white population is estimated at a frequency of 30 cases per million inhabitants to 1% of the population. Symptomatic cases of VWD are estimated at 100 per million inhabitants. Treatment is aimed at correcting the prolonged bleeding time and if present the blood clotting disorder. To achieve this, both the Von Willebrand factor and factor VIII activity pre-coagulant must be raised to normal levels in the plasma.

Case report: Female patient 6 years 10 months old was referred to the postgraduate clinic of pediatric dentistry from the city of Tijuana, BC Mexico, from Hospital Regional 20 IMSS * to receive dental care by multiple carious lesions. The patient was premature 7 months and was in an incubator for 3 h, was breastfed for 6 months and formula milk for 6 months, have completed their immunization schedule. He has been hospitalized three times for profuse bleeding. Herpes zoster was present at 6 years of age.

Comments: Multidisciplinary care was important in this case, as it successfully held the attention in the dental chair, without the patient's hospitalization.

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P15-272

Incontinentia Pigmenti: a case report

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Introduction: Incontinentia pigmenti(IP) is a X-linked dominant disorder mostly affects girls. Mutation of NEMO/IKK-gamma gene in Xq28 plays a role in pathogenesis. Four stages of IP are vesicular, verrucous, hyperpigmented and hypopigmented. Accompanying diseases include skin manifestation, CNS disorders, ocular and dental anomalies. Most common dental anomalies are hypodontia, malformed teeth and delayed eruption. A comprehensive dental treatment plan in combination of pediatric dentistry, orthodontics, prosthodontics and implant dentistry is critical.

Case report: A 4-year-old girl accompanied by mom asked for dental evaluation at Department of Pediatric Dentistry, TMUH. Her medical history of IP was diagnosed at birth. Physiologically, unrepaired atrial and ventricular septal defects plus deformity over right foot were noted. Eight primary teeth existed intraorally; no extractions history reported. Panograph demonstrated, (i) no unerupted or developing primary teeth in both jaws, and (ii) only two permanent teeth developing. Excessive loss of vertical dimension and poor mastication resulted in poor esthetics and difficulty of food ingestion. Removable partial dentures for both arches were thus treatment-planned given her age after consultation with Department of Prosthodontics.

Comments: This patient suffered from IP and associated hypodontia is experienced lack of masticatory function and insufficiency of lower facial height. After delivery of both removable partial dentures, caregivers reported shorter mealtime, improved self-confidence, and increased height and weight percentile. Close follow-ups are strongly recommended for denture adjustment or reconstruction as this patient will continue to grow. The type of permanent prosthesis and timing of placement will be rendered upon further consultation with orthodontics, prosthodontics and implant dentistry.

P15-273

Interdisciplinary oral therapy in Cleidocranial**Dysplasia: three-year evolution**

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Introduction: Cleidocranial Dysplasia (CCD) is an autosomal dominant genetic disorder, with low frequency and high variability of phenotypic expression. CCD affects prominently those bones formed through intramembranous ossification, such as cranium and clavicles, although pelvis and hands are often affected. Diagnosis of CCD is based on clinical and radiographic findings. The most common ones are delayed closure of cranial sutures, hypoplastic or aplastic clavicles, widening of the sacroiliac joints, osteopenia and multiple dental abnormalities.

Case report: A 14-year-old male patient with CCD and persistence of primary dentition was admitted to Pediatric Dental Clinic of the Dental School, University of Chile.

He had three hip surgeries. Clinical examination showed scoliosis and short stature. Intraoral examination showed multiple caries and exfoliation of upper primary incisors, canine and molars and lower primary molars. Orthopantomography and tomography showed nine supernumerary teeth in upper jaw and eight in lower jaw. Upper primary teeth were extracted, to facilitate permanent tooth eruption and a palatal expander with acrylic teeth was placed. Periodical controls for the partial eruption of the permanent teeth were made. When eruption stopped, the supernumerary extraction surgery was made. Permanent teeth eruption continues. Orthodontic treatment will be needed in order to move the teeth into their correct position.

Comments: CCD and other syndromes with serious oral manifestations should be addressed by interdisciplinary medical teams, including pediatric dentist. Early detection and treatment of dental anomalies permit to provide a functioning masticatory mechanism, improve appearance and prevent physical and emotional effects on child and adolescent patients.

P15-274

A case report of an individual with mutated NTRK1N. ISOGAWA^{1,2}, T. TANAKA³ & M. ISHIKAWA²

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Introduction: Congenital insensitivity to pain with anhidrosis (CIPA) is a rare autosomal recessive disorder characterized by recurrent episodes of unexplained fever, anhidrosis, absence of pain sensation. NTRK1 is responsible for CIPA. We present here the case of an individual with mutated NTRK1 but show the pain reaction on some teeth.

Case report: This is a six old male with repeated fever episodes infancy. At the age of four-years old an orthopedic surgeon diagnosed signs of previous fractures with no apparent pain during the incident. There was no sweating except between the fingers although sweat glands were found in the corium during a skin biopsy. Genetic examination discovered a mutation of the NTRK1 gene and a CIPA diagnosis was placed. Oral examination revealed no ulcer or wounds on his lips and tongue and caries and composite. Dental history revealed that dental treatment was performed due to dental pain. Upon examination with an electronic pulp tester it was found that several of his teeth kept pain sensation.

Comments: This case report shows that individuals with mutated NTRK1 may still feel pain and they should have regular dental examinations.

P15-275

Chiediack-Higashi Syndrome: a differential diagnosis of early onset periodontitis. A case report

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Introduction: Chédiak-Higashi Syndrome (CHS) is a rare genetic disease caused by a lysosomal defect and mutation of LYST gene. This disease presents with oculocutaneous albinism, strabismus, photophobia, nystagmus, recurrent cutaneous and respiratory infection, neutropenia, gingivitis, and severe periodontitis.

Case report: A 6.5 year-old female came to Taipei Medical University Hospital for oral examination. Her past dental history revealed premature exfoliation of primary teeth and early extractions due to severe mobility since age three. Intraoral findings included severe gingival inflammation and enlargement, attachment loss and multiple mobile teeth. Solid home care and oral hygiene practice regime were immediately implemented. Comprehensive dental, medical and laboratory examinations were therefore performed to rule out systemic disorder or syndrome, if any. Under the impression of early-onset periodontitis, dental examination revealed multiple deep periodontal pockets, extensive bony destruction, dental plaque buildup, and minimal restorative work to be done. Physical examination indicated irregular 'Café-au-lait' pigmentation spots on her face and lighter hair color. Initial laboratory data were within normal limits. Subgingival microbiological culture showed the presence of Capnocytophage, Peptostreptococcus micros, Prevotella oralis, and streptococcus. She was hospitalized one year later due to recurrent fever. DNA studies were performed and demonstrated lysosome trafficking regulator gene (LYST) on chromosome 1q42,43 was mutated. A diagnosis of Chédiak-Higashi Syndrome (CHS) was then established.

Comments: Pediatric dentist and pediatrician are the first to detect young patients with early expression of CHS.

P15-276

Ectodermal Dysplasia – a teenage challenge

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Introduction: Ectodermal dysplasia (ED) encompasses more than 200 conditions that are defined by primary defects in the development of two or more tissues derived from embryonic ectoderm. The tissues primarily involved are the skin, hair, nails, eccrine glands, and teeth. The incidence of ED is relatively rare affecting about seven of 10 000 births.

Case report: This case study presents an 11 year old female (AO) with ED. As well as characteristic hair and teeth involvement, AO was diagnosed profoundly deaf using cochlear implants since aged 29 months old. Dentally AO had moderate hypodontia in primary dentition but anodontia of the permanent dentition. Psychologically AO is anxious about her appearance and introverted. Dental function is compromised with such severe hypodontia and reduced facial height. Dentures have been constructed previously, but not worn successfully.

We describe overdenture rehabilitation and the value of a multi-professional approach with on site technical expertise including availability of consultant prosthetist and laboratory. Future treatment planning is discussed.

Comments: Rehabilitation of this patient with an overdenture markedly improved her dental appearance and function; corrected reduced facial height by increasing her occlusal vertical dimension, improved her skeletal relationship thus achieving full lip support, improved speech, and allows for future treatment planning. The psychological impact of her overdenture treatment has shown a rise in confidence, self esteem, reduction in comments at school and markedly improved quality of life. This case study shows that time and effort on all sides to achieve 'normality' is crucial.

P15-277

EDA gene mutation, c.1174t > C, in a four generation family shows clinical variability in manifesting heterozygote females

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Introduction: Hypohidrotic Ectodermal Dysplasia (HED) (MIM#305 100) is a disease characterized by defects affecting the hair, teeth, nails, skin and sweat glands to a variable degree. Incidence of HED is estimated to be one in 5000 to 10 000 live births. HED can be inherited in an autosomal dominant, autosomal recessive or X-linked manner. 95% of individuals with HED have the X-linked form and EDA is the only gene known to be

associated. Genetic locus was mapped to chromosome Xq12-q13 in 1988, EDA was cloned in 1996.

Case report: A 13 year 11 month old boy was referred to our clinic in 1997. The boy showed absence of hair, eyelashes and eyebrows, heat intolerance and absence of 24 teeth (oligodontia). He only had four teeth which were conical and small. The mother demonstrated mild symptoms such as scant hair and eyebrows. The proband was re-evaluated at the age of 27, when he already had an affected daughter with scant eyebrows and eyelashes, oligodontia with conical and small teeth. The family history showed two other family members were also affected. Altogether, three being females, and one male, who is the most severely affected in the family, suggested the X-linked form. Molecular testing of EDA gene in the proband revealed a known mutation, c.1174T > C in exon 8 (p.X392QextX29).

We will present the clinical variability of the affected individuals and the molecular results obtained in the family.

P15-278

Dental management of an Apert syndrome case

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Introduction: Apert's syndrome is an autosomal dominant inherited disease characterized mainly by acrocephaly due to synostosis of various sutures and by syndactyly, exophthalmia, ocular hypertelorism and hypoplastic midface. Mental retardation is common. Prevalence is about 1/160 000 live births. It is created by disturbances of the branchial arches in fetal development usually caused by mutations in the growth factor gene (FGFR2). In most cases the disorder results from a mutation in the father. Almost all cases are sporadic, signifying fresh mutations or environmental insult to the genome. Regarding treatment, surgery is usually needed to prevent the closing of the coronal sutures from damaging brain development, repositioning the retrognathic maxilla and separating of fingers and toes.

Case report: A 5-year-old Caucasian male presented with typical Apert syndrome findings i.e. high domed skull, hypertelorism, frontal bossing, deficient mid-face, without any signs of mental retardation. Orally, he had a low angular palate with a circular anterior open bite and forced lip closure only. Dentally, he had a primary dentition with reported congenitally missing upper centrals and in orthopantomographic radiography showed also absence of all upper incisors. Carious cavities were present in maxillary molars and lateral incisors. These were treated in the dental chair with the patient being moderately cooperative and following a preventive program for the dental disease.

Comments: The dental treatment of Apert syndrome presents a challenge to paediatric dentists and requires a multidisciplinary approach.

P15-279

Dental features and management of Silver Russell syndrome

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Introduction: Silver Russell syndrome (SRS) is a form of dwarfism characterised by intrauterine growth retardation with subsequent severe post natal growth impairment. It has a reported incidence of between 1/3 000 and 1/10 000 live births and a largely unknown aetiology. Marked variation in features of the syndrome exist but those most commonly reported include low birth weight, short stature, body asymmetry, fifth finger clinodactyly, frontal bossing and micrognathia. Specific dental features include delayed dental development, microdontia and hypodontia. Although no specific treatment protocol for SRS exists, to maximise growth, hormone replacement (in deficient individuals) and supplemented nutrition are often provided.

Case report: Two female patients (Patient A: 5-years-old; Patient B: 12 years old) with previously diagnosed SRS were referred to the Department of Paediatric Dentistry. Upon clinical examination, both patients were of short stature, exhibited frontal bossing, had a class II skeletal relationship, a high vaulted palate, dental caries and non-carious tooth surface loss. Targeted preventative advice and restoration of any carious lesions was undertaken for both patients. In addition, Patient A had a complete traumatic overbite and maxillary and mandibular crowding while Patient B exhibited hypodontia and microdontia necessitating orthodontic treatment using fixed appliances to redistribute spaces. Subsequently Patient B underwent build-up of her maxillary incisor teeth with composite resin to further improve her dental aesthetics.

Comments: This case report describes the features and management of patients with SRS. It highlights the importance of an aggressive preventive strategy for this group of patients who are at high caries risk.

P15-280

The ectrodactyly–ectodermal dysplasia–clefting (Eec) syndrome: a case reportS. ZORLU¹, G. KOYUNCUOGLU¹, D. ONER OZDAS¹, M. A. ERDEM² & G. AREN¹*¹Faculty of Dentistry, Department of Pedodontics, Istanbul University, Istanbul, Turkey; ²Faculty of Dentistry, Department of Oral Surgery, Istanbul University, Istanbul, Turkey*

Introduction: The ectrodactyly–ectodermal dysplasia–clefting (EEC) syndrome is a multiple congenital anomaly characterized by split hand/foot malformation, anomalies of hair, teeth, nails, nasolacrimal ducts, and sweat glands, and cleft lip with or without cleft palate.

Case report: A 14 year old female patient with EEC syndrome referred to Istanbul University, Faculty of Dentistry, Department of Pedodontics with complaints of missing teeth and esthetic concerns. Orofacial examination revealed oligodontia, enamel hypoplasia, microdontia, dental caries, impacted mandibular right canine and operated cleft lip. Dental treatment including conservative, endodontic, surgical and prosthodontic treatments were performed and patient was followed up for two years.

Comments: This case report emphasizes that oral management of these cases requires a multidisciplinary approach and highlights the need of optimizing the oral health of patients with EEC syndrome.

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P16-281

Dental erosion in children with asthma under bronchodilator medication

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Background: Asthma is a chronic inflammatory condition that causes airways to constrict and difficult breathing. Asthma medication includes bronchodilators and anticholinergic drugs. Most of these drugs are inhaled using different presentations of inhalers. It has been reported that medicines taken by a dry powder inhaler may cause tooth erosion by changing the chemical environment of the mouth.

Aim: The purpose of the present study was to determine prevalence of dental erosion in children under bronchodilators medication and to establish association between the type of drugs and frequency of acid beverages intake.

Design: Sample included 50 medicated children (5.52 ± 1.29 y.o.) using medication inhaler during the last 9 months. Children's parents completed a questionnaire about general health and beverage consumption. Dental exams were performed and loss of dental tissue according to Smith (1984) were determined. Frequency distributions of variables included in the questionnaire were determined. Mean and SE of dental erosion index were calculated. Association and correlation among variables was analyzed.

Results: 80% of the children used salbutamol (pH 3.4) and 20% used cromoglicato disodico (pH 5.2). 52% of the sample showed dental erosion, 60% in salbutamol users and 20% in cromoglicato users. Positive association ($\chi^2 = 5.02$, $P < 0.03$) as well as significant correlation were established between medication and dental erosion ($\rho = 0.32$, $P < 0.03$). No association was found between other variables.

Conclusion: Relationship between erosion and medication was found on patients using medications inhalers. Further research is required to establish asthma medications as risk factors for dental erosion.

P16-282

The effect of parent's oral health related behaviors on the caries risk factors of children

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Aim: The purpose of this study was determine the relationship between caries risk factors and parent's oral health related behaviors in order to accurately predict the onset of caries and guide the oral health behavior accordingly.

Design: This study included questionnaire and laboratory testing. We investigated 15 variables, concerning the parent's oral health related behavior, by delivered questionnaire to the mother. All children were divided into two groups based on the answers: healthy oral behavior group and not-healthy oral behavior group. On the other hand, we tested the content of calcium, phosphate and

fluoride ion and the CFU number of *Streptococcus mutans* and *Lactobacillus* in children's saliva and plaque biofilm. The differences of caries risk factors between two groups were analyzed. We also analyzed which behavior variables influenced specific caries risk factors by means of stepwise regression. Finally, we tried to describe how parent's behaviors influenced the children's behavior and caries risk factors by means of correlate analysis.

Results: This study showed that the number of microbes had a close connection with the oral health behavior. The CFU number of *Streptococcus mutans* in saliva and plaque biofilm between the two groups was different statistically. The CFU number of *Lactobacillus* in plaque between two groups was also different statistically. The content of calcium, fluoride ions in saliva and plaque fluid and phosphate ion in saliva differed statistically between two groups. The outcome of stepwise regression shows that among all the behavior variables, the frequency of children's drinking soft drinks, the frequency of parents' brushing teeth and the age at which the children begin brush teeth influenced the caries risk factors statistically.

Conclusion: Parent's oral health related behaviors did influence the caries risk factors of children. Besides the conventional caries risk factors, the Parent's behavioral variables should be considered to be incorporated into the caries prediction program.

P16-283

Effect of two kinds chewing gum on salivary secretion

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Background: As one type of oral health care product chewing gum has been attractive for its convenience and pleasant taste. Chewing gum can increase salivary flow rate. Tea polyphenol which is extracted from tea has been tested to inhibit the growth and metabolism of oral microorganisms as well as salivary amylase activity of host.

Aim: The purpose of this investigation is to evaluate the effect of chewing gum on salivary secretion by testing the salivary flow rate and pH value before and after chewing gum with or without tea polyphenol.

Design: 10 students aged from 23 to 27 years old were randomly divided into two groups. Each group was given tea polyphenol chewing gum, the control gum respectively. The subjects should chew more than 30 times per minute. We collected the saliva of each subject before and after chewing for every 1 min in the Eppendorf tube. The pH of saliva was read by 250 pH meter. After one-week wash-out period each group change the measure. The data were analyzed by one-way ANOVA and SNK.

Results: After chewing gum the salivary flow rate was obviously higher than before. And the pH was also elevated from 6.9 to 7.3. But there was no statistical significance when we compared the two kinds of chewing gum ($P > 0.05$).

Conclusion: It can be concluded that chewing gum has evident effect on the increase of salivary secretion and the elevation of the pH value. Thus it can make the teeth clean and promote oral health.

P16-284

Consumption habits and oral health in preschool childrenA. PISTOCHINI¹, S. PISANIAK², V. MARCO² & R. DOÑO¹¹Dentistry School, Faculty of Health Sciences- Maimonides University, Buenos Aires, Argentina; ²Nutrition School, Faculty of Health Sciences- Maimonides University, Buenos Aires, Argentina**Background:** Consumption of acidic beverages has become common place in the average home.**Aim:** The aim of the present study was to evaluate beverage consumption habits and dental status in preschool children to develop a program called Nutrition and Oral Health: Food Healthy, Happy Smiles (NOH).**Design:** The study comprised 53 children attending a public kindergarten in Buenos Aires city, including 21 boys and 32 girls; average age was 3.86 (\pm SD 0.98). Children's parents filled in a questionnaire inquiring about general health, educational preventive measures, and beverage consumption. 26 children were randomly selected and subjected to dental examination, to determine of their *dmft* and *dmfs* scores, loss of dental tissue, according to Smith and Knight (1984). Frequency distribution of the variables included in the questionnaire was determined, mean and SE of the dental indicators was calculated, and correlation among variables was analyzed.Frequency distribution showed that 9% took medication, 28% suffered from allergies, 6% asthma. The mean of sugar consumption moments was 4.76 ± 0.219 SE. 19% received topical applications of fluoride, 73% used fluoridated toothpaste. The preferred beverage was regular juices in 89% of cases; 69% soft drinks, 28% sport drinks. *DMFT* was 3.38 ± 0.779 (SE) and *dmfs* was 5 ± 1.708 (SE). 81% of children presented loss of dental tissue.**Conclusion:** Considering the results of this study, the aims proposed for NOH were – Educating on oral health and healthy foods to preschool children – Raise awareness among parents and teachers of the importance of oral health care of their children – Developing guidelines for Healthy eating.

P16-285

A study on the change of hue of fluoride varnish after application on tooth surface

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Background: Fluoride is essential in preventing caries and in the remineralization of initial carious lesions. One of the mostly used fluoride products is fluoride varnish with natural or pine resin. The resin materials give the product sticky properties resulting in a longer contact time, permitting prolonged fluoride exposure. Fluoride products in current markets display different shades of hue after coated on the tooth surfaces.**Aim:** This paper evaluates the hue of fluoride varnish after application on the tooth surface and also its change as time passes.**Design:** Among extracted maxillary primary incisors, teeth with natural and healthy color were selected to be used as the subjects for this study. Colorimeter (ShadeEye NCC, Shofu, Japan) was utilized in evaluating the hue at the center of the prepared teeth

materials. Four fluoride varnishes of different manufacturer's were applied onto the prepared materials. The change of hue with time was evaluated with colorimeter.

Results:

- 1 Fluor protector (Vivadent, Germany) – L*, a* value is increased, b* value is decreased.
- 2 Flor-Opal varnish White(Ultradent, USA) – There was no significant change.
- 3 Cavityshield(3M, USA) - L* value is decreased. a* value is not significantly changed, b* value is increased.
4. FluoroDose(Shinhung, Korea) - L* value is decreased, a* value is not significantly changed, b* value is increased.

Conclusions:

- 1 The hue of the prepared teeth materials after fluoride varnish application differed from that of natural and healthy teeth.
- 2 The differences of the hue of the prepared teeth materials with different fluoride products are statistically significant.

P16-286

Effectiveness of oral health instruction on knowledge of pregnant women attending the Ahwaz Health Centers in IranL. BASSIR¹ & M. KHANEHMASJEDIL²¹Department of Paedodontics, Dental School Jondi Shapoor University of Medical Science, Ahwaz, Iran; ²Department of Orthodontics, Dental School Jondi Shapoor University of Medical Science, Ahwaz, Iran**Background:** Pregnancy is a 'teachable moment' during which women may be particularly amenable to making health behavior changes that can have significant impact, not only on themselves, but also on their offspring.**Aim:** The aim of this research evaluation of the effectiveness of oral health instruction on knowledge of pregnant women attending the hygiene centers in Ahwaz-Iran.**Design:** In an interventional study 150 pregnant women (second trimester) who came to health centers were selected accidentally. A coded questionnaire was administered to the pregnant women to assess their knowledge, attitudes and practices to dental health (pretest), followed by their oral examination (with CPITN). Then they participated in the on-site oral health education and training programme. After 12 weeks, (CPITN) index registered, and posttest was done. The forms were filled, completed analyzed at the point of descriptive statistically and Chi-square test and Wilcoxon.**Results:** The results were shown the knowledge and attitude significantly increased in post test ($P < 0.00$). There was a significant association between dental knowledge and practices with both education and socio-economic status. Women with less education and lower socio-economic status were more likely to be at higher risk of poor periodontal health. 70% of women had various form of periodontal problems that improved moderately in second examination.**Conclusions:** The repetition of health training, periodical examination by authorities of health centers lead to increasing pregnant women information about oral and dental health and improved oral health and ultimately improved pregnancy outcomes.

P16-287

Mothers' knowledge on the role of food in early childhood caries occurrence

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Background: The etiology of early childhood caries (ECC) is multifactorial and very complex. An important role in the etiology of ECC has dietary habits, especially bottle feeding and sweet consumption.

Methods: The study included 130 children with diagnosed ECC, age 3–5 years from the Prishtina kindergartens. Their mothers were interviewed regarding feeding habits and their knowledge about the role of food in the ECC occurrence. The examination protocol was based on the WHO criteria. The statistical significance was tested using Chi-square test for $P < 0.05$.

Results: Mean deft in children with ECC was 10.5. The results from the interview showed that 80% of the mothers use bottle-feeding for their children, while around 60% of children go to sleep with the bottle. Over 90% of mothers at least once a day give their children sweet foods. Majority (92%) of these mothers, aren't aware that bottle feeding may cause ECC. Mothers usually believe that sleeping with the bottle, helps children sleeping 'better' and faster. Although 75% of mothers are aware that sweet food is harmful to children's teeth. But, they still think that a deciduous tooth 'is not so important, because it will be replaced with a permanent tooth'.

Conclusion: Unfortunately, there is general lack of mother's knowledge regarding the feeding habits. Mother's knowledge about oral health, and especially on the role and the way of feeding, is important for caries prevention, particularly of ECC.

P16-288

Effect of Tooth Mousse and MI Paste Plus on molar - incisor hypomineralisation: a pilot study

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Background: Casein phosphopeptide-amorphous calcium phosphate (CPP-ACP)(GC Tooth MousseTM) and casein phosphopeptide-amorphous calcium fluoride phosphate (CPPACFP) MI Paste PlusTM reverses the subsurface mineral loss and used in non-invasive treatment of mild to moderate Molar-Incisor-Hypomineralisation(MIH).

Aim: The aim of this clinical study was to compare the effect of a paste containing 10%CPP-ACP (GC Tooth MousseTM) and 10%CPP-ACP+900 ppm F containing paste MI Paste PlusTM for mild to moderate Molar-Incisor-Hypomineralisation(MIH) *in vivo*.

Design: Subjects were selected from MU Dental School, Dept of Pediatric Dentistry. A. total of 38 children with MIH were included to this study. 15 of them with MIH were used GC Tooth MousseTM and 23 children were used MI Paste PlusTM Noncavitated incisors and molar teeth with demarcated opacities were evaluated. The examinations were carried out in clinic under reflector light conditions using sterile mirrors and blunt probes and compressed

air. The subjects were used twice a day for a month period. At the baseline and at the completion of the treatments, mineralization determined using a laser-induced infrared fluorescence (DIAGNOdent) method. The laser device was applied on each dried surface with an air syringe for 10 s. After 1 month, the same operator repeated evaluations. Data were computerized and analysed using SPSS 16.0 software. Student's paired *t*-test were used to compare before and after the treatments and unpaired *t* test were used to compare the treatment types.

Results: GC Tooth MousseTM and MI Paste PlusTM produced remineralization. The mean DIAGNOdent results for surfaces of the permanent teeth before GC Tooth MousseTM application was 3.739 ± 2.911 and after was 1.826 ± 1.775 ($P = 0.0015$), and MI Paste PlusTM application was 5.267 ± 2.815 and after was 2.667 ± 2.320 ($P = 0.0001$). The mineral content change was 60.351% in GC Tooth MousseTM and 45.514% in MI Paste PlusTM. But, there was no statistically significant difference between GC Tooth MousseTM and MI Paste PlusTM ($P = 0.2461$). CPP ACP have a certain positive effect on enamel remineralization.

Conclusions: From the results it can be concluded that GC Tooth MousseTM and MI Paste PlusTM promote remineralization of enamel with MIH *in vivo*. Further investigation under clinical conditions are required.

P16-289

Correlation between obesity, oral health and dietary preferences in children

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Background: The purpose of this study was to examine any relationship between age-specific body mass index (BMI-for-age), oral health and lifestyle factors among children in Serbia.

Design: One hundred and thirty overweight/obese children were examined for this study. They were classified in three groups according to BMI percentile ($p > 97$, $p 95-97$, $p 90-95$). Parents were asked to fill in questionnaires considering food frequency, lifestyle and oral hygiene of their children. The clinical data and anthropometric measurements were obtained according to the WHO criteria. The parameters examined were DMFT/dmft, plaque and gingival indexes (Löe-Sillness), BMI percentiles, dietary and oral hygiene habits.

Results: Children with BMI percentile >97 had significantly higher prevalence of decayed teeth comparing to other two groups ($P < 0.05$). In addition, these children had more frequent preference to sweet food intake than others. Plaque and gingival indices were the highest in this group as well ($P < 0.05$). The poorest hygiene habits were also found in children with BMI percentile >97 (17% children do not brush teeth daily).

Conclusions: Both medical and dental examination of any pediatric patient should include BMI and dietary habits. Suitable health policies should be adopted to decrease the high prevalence of dental caries among overweight and obese children.

P16-290

Cardiogenicity effects of three popular milks via dental plaque pH: plain bovine milk, soy milk and chocolate milkP. MOEINY¹, M. S. ASGARI² & F. NAMAZI³¹*Department of Pediatric Dentistry, Dental Branch, Islamic Azad University, Iran;* ²*Private Practice, Iran;* ³*Dental student of Islamic Azad University, Iran*

Background: Milk is believed as healthy and nutrient drink among other kinds of beverages. Nowadays flavored milks, especially chocolate milk, not only are well liked, in particular by children, but also parents and school food services support intake of this beverage. Besides there is a new tendency to consuming soy milk in whole world and it is believed that soy milk is a good substitute for bovine milk especially in lactose-intolerant people.

Aim: The aim of this study was cariogenicity evaluation of three popular milk (plain bovine milk, soy milk and chocolate milk) through determining dental plaque pH.

Design: In this study 10 healthy dental students in age range of 25–32 were selected upon study entrance criteria. Dental plaque pH in selected interproximal areas of teeth was taken by micro electrode and digital pH meter before and after 2,5,7,10,15,20 min rising with four test materials (which includes : bovine milk, soy milk, chocolate milk and sucrose solution 10% as control). Then pH curves were drawn according to time.

Result: Acidogenicity of these three kinds of milks was different. The differences were significant ($P < 0.05$).

Conclusion: According to the results, acidogenicity of these three kinds of milk showed drastic difference, so their effect on dental health must be considered when they are suggested as a substitute for bovine plain milk.

P16-291

Prevalence of early child caries in headstart programs of northeast Ohio

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Background: Early Childhood Caries (ECC) is the number one chronic disease in American children today.

Aim: To determine the prevalence rate of early childhood caries in headstart and early headstart children from ages two to five in Northeast Ohio.

Design: An institutional pediatric dental service set up initial and 6 month recalls with 218 headstart and early headstart centers in

nine counties in Northeast Ohio. 12 000 children ages two to five received oral health exams. This was followed by a dental prophylaxis and fluoride varnish application. All the children who received treatment were classified as having no tooth decay, moderate tooth decay or severe tooth decay.

Results: Four out of every 10 children have ECC. Of the 12 000 examined, 15% have severe ECC, and 23% have moderate ECC. 62% of the children had no visible sign of ECC.

Conclusions: A total of 38% of children suffer from moderate to severe ECC. This is 10% greater than the national ECC rate of 28% in children ages two to five.

P16-292

Characteristics and compliance of paediatric patients to a recall system between 1990–2000 and 2000–2010 in a private dental practice

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Background: Analysis of the profile and characteristics of the patients following a recall preventive program might help to improve the compliance to such recall system.

Aim: To evaluate the behavior and the characteristics of patients following a mailing recall system in a private setting during 1990–2000 and a mailing system plus a phone call as a reminder during 2000–2010.

Design: The sample consisted of 2 937 patients for the period 1990–2000 and 4 797 patients for the period 2000–2010 with ages ranging from 3–16 years, (7.4 ± 3.00 and 7.7 ± 3.08). Patients with serious medical problems or developmental lesion in hard dental tissues were excluded from the sample.

Results: It was found that between the two periods 1990–2000 versus 2000–2010, 27.6% vs 35.3% of the patients did not attend any recall after the first visit, 72.4% vs 60.8% came once, 47.0% vs 52.6% came twice and 7.3% vs 27.5% came ten or more times. In terms of duration of the follow-up, a percentage of 28.6% vs 24.8% was stayed up for 1–3 years, 18.5% vs 40.4% for 3–5 years and 12.6% vs 21.1% more than five years. The months of June (12%) and September (12%) were the most popular months for recall visits, while the most referrals came from patients (50%), followed by Dentists (28%), Paediatricians (8%) and other sources (17.7%).

Conclusions: The compliance the continuity and the duration of the period that patients followed the recall system were improved to a large extent at the second period and the addition of the reminder phone call might have been one of the reasons for such an improvement.

P16-293

Antimicrobial efficacy of NaF-toothpastes

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Background: Since 1982, in industrial nations a caries decline has been observed, which is based on the wide availability of fluoride in toothpastes and its remineralizing effect.

Aim: The aim of this in-vitro study was to determine the antimicrobial efficacy (AE) of ingredients in toothpastes on the synergistic reduction of supra- and subgingival biofilms.

Design: The agar diffusion assay was performed with reference strains of *A. naeslundii*, *A. odontolyticus*, *S. mutans*, *S. sobrinus*, *S. sanguinis*, *L. casei*, *L. plantarum*, *L. coryniformis*, *A. actinomycetemcomitans*, *F. nucleatum*, *P. gingivalis*, *S. aureus*, *E. faecalis*, and *C. albicans*. Into reservoirs (10 mm) in Balmelli agar mixed with the reference strains, 0.3 g each of the NaF-toothpastes was placed. 20 toothpastes contained only 1400–1450 ppm NaF. 12 toothpastes contained additionally triclosan, 19 zinc, 3 zinc in combination with tin, 17 natural antimicrobials. Aqua dest. and H₂O₂ served as controls. After an anaerobic incubation of 24 h at 37°C the inhibition zones were measured. Means and standard deviations were calculated, and differences in AE of the toothpastes were analyzed using the Mann-Whitney-Test ($P < 0.05$).

Results: In general, the microbes were inhibited in the following order: actinomyces > periodontopathogens ≥ *S. aureus* = streptococci ≥ *C. albicans* ≥ lactobacilli > *E. faecalis*, with inhibition zones sized 14–36 mm. Toothpastes with zinc/tin produced significantly larger inhibition zones compared with those with NaF or natural antimicrobials or zinc. Triclosan-toothpastes caused the largest inhibition zones; *S. aureus* was most strongly inhibited.

Conclusions: The remineralising effect of NaF-toothpastes is supported by the antimicrobial effect of the various ingredients.

P16-294

Dietary counseling beyond caries prevention

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Background: Although the dental profession recognizes the role of good nutrition and appropriate dietary practices in achieving and maintaining good oral and health the execution of process has been focusing on the prevention of dental caries. However there are many other serious diet-related health conditions affecting children that should be raised up during the dental visit.

Aim: The purpose of the poster is to highlight the role of dentist in educating parents on dietary recommendations to end up with patients who not only have good oral health but whose general health reflects our vision of well-being.

P16-295

Maternal xylitol exposure: long-term effect on caries prevalence in their offspring's

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Background: We have previously demonstrated less caries in the primary dentition in children of mothers who used chewing gums

with xylitol during eruption of the first primary teeth compared with those who used gums containing chlorhexidine or fluoride.

Aim: To evaluate a possible long-term caries-preventive effect in the young permanent dentition.

Design: Randomized controlled trial. Ten years ago, 173 mothers with high counts of salivary mutans streptococci were randomly assigned into three experimental chewing-gum groups containing A) xylitol ($n = 61$), B) chlorhexidine ($n = 55$), and C) sodium fluoride ($n = 57$). The intervention started when each child was 6 months and was terminated one year later. The mothers were instructed to chew one piece of the designated gum for 5 min, three times a day. The children were examined yearly and initial and manifest lesions were scored according to the WHO-criteria and expressed as decayed surfaces (DS).

Results: One hundred and forty of the allocated children were re-examined at the age of 10 years (dropout rate 21%). The caries prevalence (DS > 0) was 28.6%, 37.2% and 29.2% in groups A, B and C, respectively. The corresponding mean DS-values were 0.69, 0.98 and 0.56. The differences between the groups were not statistically significant.

Conclusions: No long-term benefits from maternal exposure to xylitol-containing chewing-gums during eruption of their offspring's first primary teeth were disclosed when compared to similar exposures to chlorhexidine or fluoride.

P16-296

Effect of a newly developed nano-sealing liquid on enamel demineralization-acid resistance induced by a newly developed nano-sealing liquid

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Background: We have newly formulated a nano-sealing liquid which contains Ca, PO₄, F and silicate, and designed for coating of tooth surfaces to improve acid resistance.

Aim: The purpose of this study was to evaluate the effect of a new formula on demineralization of enamel surfaces by using a quantitative light-induced fluorescence (QLF) and a field emission scanning electron microscopy (FE-SEM), and to compare the results with APF's.

Design: Enamel test specimens were treated with APF(liquid) for 5 min, APF(gel) for 5 min, and a new formula for 20 s, and then stored in 0.1 M lactic acid buffer solution(pH 4.5) for 72 h. Treatment and demineralization were repeated three times in total. A QLF and an FE-SEM of the treated specimens were observed and compared with a non-treated specimen (control).

Results: None of the change in demineralization was observed with a new formula treated enamel surfaces while a control and APF's showed severe decalcification under FE-SEM observation. The mean F(±SD) values after the first 72 h demineralization were: –21.85 ± 16.86 with a new formula, –87.44 ± 21.19 with a liquid APF, –85.45 ± 22.89 with a gel APF, and –94.45 ± 27.93 with a control.

Conclusion: A new formula exhibited a remarkably excellent acid-proof performance which was significantly much superior than APF's and a control's under the severe demineralization condition (three cycles in pH 4.5 media for 72 h). It was concluded that a new formula has the potential to prevent caries in many dental occasions.

P16–297

Cooperation between parents of preschool children and dentists

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Background: During the first years of children's life, parents should take care about their regular and orderly oral hygiene. Moreover, they should educate the children about efficient tooth cleaning, preferentially, in direct cooperation with a paediatric dentist.

Aim: To present a study regarding the oral hygiene habits of 2–5 years old children through a parental questionnaire.

Design: In scope of a 5 years anonymous study (2006–2010), we have contacted 1 836 parents of children from 2 to 5 years of age. 47% of parents participated in this survey. The questions addressed the following issues: age of the beginning with tooth cleaning, periodicity of cleaning, tooth brushing methods, use of tooth paste for cleaning, the person who gave the parents instructions about oral hygiene, age of the child's first visit to a dentist, age of the first dental problems, education degree of the parents.

Results-Conclusions: Comprehensive evaluation of the questionnaire has revealed that the education of the parents should be directed to (i) the beginning of tooth cleaning by the time of eruption of the first teeth, (ii) regular cleaning twice per day, (iii) the use of tooth paste and final re-cleaning by the parents, and (iv) the first visit to a dentist at the age of one year.

P16–298

Effect of tablets containing IgY on salivary *Streptococcus mutans* in young childrenH. SHIRAI¹, T. YONEZU² & S. SHINTANI²*¹Combi Corporation, Japan; ²Department of Pediatric Dentistry, Tokyo Dental College, Japan*

Background: Early Childhood Caries remains a significant problem for children in Japan. One strategy for preventing dental caries is to suppress *Streptococcus mutans* (*S. mutans*), the chief pathogen for the disease. We studied the effects of topical application of tablets containing IgY (immunoglobulin yolk against *S. mutans*) on salivary *S. mutans* in young adults and suggested that IgY tablets may provide a feasible caries prevention method for young children.

Aim: To investigate the use of tablets containing IgY on salivary *S. mutans* levels in young children.

Design: This was a double-blind, linear crossover, within group comparative experimental trial conducted among 11 young children aged 18 to 39 months. All subjects were positive for *S. mutans* at pre-examination. The study was divided into two phases: (i) experimental tablet (IgY: 5.1 mg, xylitol: 85 mg), and (ii) control tablet (xylitol: 85 mg). The children chewed tablet three times a day for 2 weeks. Whole saliva was collected at baseline and after the intervention. Salivary *S. mutans* counts were evaluated by real-time PCR.

Results: The mean counts of Salivary *S. mutans* at phase 1 was significantly reduced with statistical significance ($P < 0.01$) when compared with baseline. Total counts of streptococci also reduced with statistical significance ($P < 0.01$). On the other hand, there was no significant drop in mean counts of *S. mutans* from baseline at phase 2.

Conclusions: This study supports the suggestion that combination of IgY and xylitol tablets can reduce the levels of salivary *S. mutans*, but xylitol tablet did not seem to enhance this effect.

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P17-299

Atopic cheilitis in children with cow's milk protein allergy

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Background: Cow's milk antigens belong to the first class allergens. **Aim:** to find out the effect of ointment lip therapy with 0.05% Afloderm and 0.1% Advantan in case of complex atopic cheilitis treatment as well as 0.05% Afloderm and 2% Fucidine in case of complex treatment of atopic cheilitis accompanied by streptostaphylococcal infection.

Design: 100 children with cow's milk protein allergy aged 3–12 years took part in the clinical study. Depending on the cheilitis type the severity of perioral atopic manifestations was determined. In case of isolated atopic cheilitis slight lesions of lips were found oftener (14 children). In case of atopic cheilitis accompanied by atopic dermatitis the disease was mild and severe. The complex treatment included ointment lip therapy with 0.05% Afloderm (Gedeon Richter) and 0.1% Advantan (Schering). In case of additional streptostaphylococcal infection the ointments 0.05% Afloderm and 2% Fucidine (Leo Pharmaceutical) were used in equal parts.

Results: the above-mentioned medicines have not only local but complex effect on the organism as the neuroreceptor system is involved through skin absorption.

Conclusions: Disappearance or reduction of skin eruptions and internal sensations such as itch and burning had a positive effect on both general and psychoemotional states of the children.

P17-300

Dental follicular hamartoma: a case report

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Introduction: Dental Follicular Hamartoma (DFH) is a general term referring to hamartomatous lesions of odontogenic origin, which are located in the opercula of unerupted teeth and associated with delayed tooth eruption. Similar entities have been described in the past with diverse terms, such as odontogenic giant cell fibromatosis and pericoronal myxomatous hyperplasia. The purpose of this study is to report a case of DFH and to present the histological criteria for diagnosis, focusing on the features allowing distinction from similarly looking odontogenic neoplastic lesions.

Case report: An eleven year old boy presented with bilateral whitish nodular lesions at the area of unerupted mandibular first molars. Both lesions were asymptomatic and were initially noticed by the family dentist. Both lesions were biopsied and submitted for histopathological examination. Microscopically, the lesions contained islands of odontogenic epithelium in a dense fibrous or

myxomatous connective tissue background. Numerous stellate cells with one or two nuclei along with dispersed multinucleated cells and cementum-like calcifications were noticed. The overlying parakeratinized epithelium exhibited focal acanthosis. The diagnosis of DFH was rendered based on the histological features in combination with the location of the lesions at the opercula of the unerupted first molars.

Comments: Diverse terminology has been used to describe odontogenic hamartomatous lesions located in the operculum of an unerupted tooth. The term DFH clarifies the hamartomatous nature of the lesion, as well as its origin from the dental follicle, separating it from neoplastic entities with similar histological features, such as peripheral odontogenic fibroma.

P17-301

Extraction of an impacted mandibular second premolar in two steps: a case report

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Introduction: The aim of the study was to describe a stepwise multidisciplinary approach for the extraction of an impacted mandibular second premolar.

Case report: A fifteen-year-old Caucasian boy was presented at the Postgraduate Clinic of Orthodontics, Dental School, University of Athens, with a ClassI malocclusion, open bite and moderate space deficiency. Deciduous second left mandibular molar was still present. Radiographic examination revealed tooth #35 to be impacted in a disto-buccal position, in close proximity with the mesial root of #36, that was partly resorbed. Orthodontic treatment plan included four second premolar extractions. The patient was referred for impacted premolar extraction to the Department of Oral and Maxillofacial Surgery. The unfavourable position of the impacted tooth, deep into the alveolus and its close proximity to the mandibular canal, implied high risk of mandibular fracture and inferior alveolar nerve injury. It was then requested by surgeons to move the impacted premolar away from the inferior border of mandibular body, in order to proceed to its removal, without severe postsurgical complications. Deciduous molar was extracted, impacted tooth was surgically exposed and an attachment was bonded. A lingual arch, with a cantilever activated a week after surgery, was used for its traction. Two months later, premolar was seen radiographically in a greater distance from the lower border of the mandible. Tooth extraction followed, without causing mandibular fracture or nerve damage.

Comments: In cases with serious considerations for complications after impacted tooth extraction, the above stepwise approach provides safety and can be preferred.

P17-302

Simple bone cyst. Report of two cases and review of the literature

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Introduction: Simple bone cyst (traumatic or hemorrhage bone cyst) is an uncommon pseudocyst of the jaws. It is mainly diagnosed in the mandibular jaw body of young males usually during the second decade of life, being asymptomatic in the majority of cases. It is often discovered on routine radiological examination usually appearing as a unilocular radiolucent area with irregular but well defined outline with a scalloping effect. Definite diagnosis is established after surgical exploration of the lesion which is the recommended treatment modality. Two new cases of simple bone cysts are reported and a review of the literature is presented.

Case report: The first case concerned a 13-year-old white female that presented with an asymptomatic lesion, discovered on a routine radiological examination as a unilocular radiolucent area between the lower left canine and 1st premolar, while there was no intraoral or extraoral swelling. In the second case, a 14-year-old white female presented with a small asymptomatic swelling extending between the lower left molars. Radiological examination revealed a unilocular radiolucent area between the roots of two molars. No trauma history was reported and all involved teeth were vital in both cases. During surgical exploration of both cases an empty cavity was found and a diagnosis of simple bone cyst was made.

Comments: Simple bone cyst should be included in the differential diagnosis of mandibular radiolucent lesions in children, even in cases where trauma history is not reported. Before surgical exploration, a vitality test of all involved teeth should be performed.

P17-303

Tumors and tumor-like lesions of the orofacial region in children. The contribution of paediatric dentist

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Background: The paediatric dentist in his everyday practice may come across with pathological entities of the oral region. Clinical and radiographic examinations are helpful for the first evaluation of tumors and tumorous lesions. Their treatment depends on the nature and the size of the lesion.

Aim: To present the characteristics and treatment management of such lesions in children, based on 11 years of experience.

Design: Data were retrieved from patients files and follow-up documentation. 324 patients, 173 boys and 151 girls, treated from

1999–2010, were included. Patients were classified in groups of pathological entities. Clinical findings such as delayed eruption, deviation or displacement of teeth, swelling of the jaws or the soft tissues, presence of pain, duration of the symptoms as well as the treatment protocols were registered.

Results: 166 tumors and tumorous lesions were intraosseous and 158 tumors of the soft tissues. 307 lesions were benign (129 were cysts of the hard and soft tissues). All tumors and tumorous lesions of the soft tissues presented as a swelling. Intraosseous ones depending on their size caused bone expansion. Our findings are similar to the previously reported in the literature. All benign tumors were surgically excised and malignant ones were treated according to the indicated protocols.

Conclusions: Dentists and paediatric dentists need to be aware and thoroughly examine children, in order to early identify and contribute to diagnosis and treatment of tumors.

P17-304

Tumors of minor salivary glands in childhood: a clinico-pathological study

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Background: Salivary gland neoplasms are relatively uncommon lesions accounting for <3% of all head and neck tumors. Tumors of minor salivary gland origin (MSGT) constitute <25% of all salivary gland tumors and are considered rare during childhood.

Aim: To investigate the relative frequency and histological features of MSGT in children in a large cohort of biopsied oral lesions.

Design: All cases with a histological diagnosis of MSGT in children (age < 16 years) were retrieved from the files of the Laboratory of Oral Pathology, School of Dentistry, University of Athens, Greece between 1970–2009. Information regarding age, gender and anatomical location of the tumors was collected from the patients' records. All cases with available histological slides were re-evaluated according to specific histopathologic parameters such as tumor cell composition and morphology, stromal features and infiltration of surrounding tissues.

Results: Among 197 cases diagnosed as MSGT only 6 (3%) affected children. All six cases were diagnosed as benign pleomorphic adenomas; no malignant neoplasms were identified. The female to male ratio was 5:1 and the mean age was 12.8 years. The most common site of involvement was the palate (66.6%). Histological slides were available in three cases. Microscopically, two cases showed prominent cellularity, while predominance of the stroma was observed in the third case. The stroma consisted of dense, fibrous connective tissue (two cases) or chondromyxoid tissue (one case). Infiltration of surrounding tissues by neoplastic cells was not observed.

Conclusions: Our study confirms the scarcity of MSGT in childhood and adolescence.

P17-305

Mucocles and ranulas in children and adolescence. A clinicostatistical and histopathological study

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Background: Mucocles are of the most common benign soft tissue cystic lesions of oral mucosa that, most often, result from local trauma of a salivary gland duct. In addition ranulas, are extravasation mucocles, that occur on the floor of the mouth, and usually are located lateral to the midline.

Aim: The objective of this study is the retrospective clinicostatistical and histopathological analysis of mucocles and ranulas in children and adolescents.

Design: 72 cases of mucocles and six cases of ranulas from the archives of the Department of Oral Medicine and Pathology of the Dental School, Aristotle University of Thessaloniki, were retrieved and reviewed. Inclusion criteria for the participation in the investigation included informed consent of the patients, and confirmed histopathological diagnosis of the lesions. The clinical data and the histopathological characteristics of the lesions were recorded, and statistical analysis was performed.

Results: Females (54.1%) from 11 to 15-year-olds (40.2%) are most commonly predisposed for mucocles and specifically located on the lower lip (84.7%). Ranulas are most prevalent from 11 to 15-year-olds (50%) with distinct female predilection (83.3%). The histologic picture is characterized by the liberation of mucin, surrounded by a granulation tissue response, accompanied by an inflammatory reaction that includes neutrophils, plasma cells, lymphocytes and macrophages.

Conclusions: Mucocles and ranulas predominate in female patients of 11 to 15-year-olds, with the lower lip being the most frequently affected site in mucocles. The microscopic appearance of the ranulas is similar to that of mucocles.

P17-306

Giant cell fibroma: clinicopathological study of 11 cases in children

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Background: Giant cell fibroma (GCF), a benign fibrous mucosal tumor with distinctive histopathologic features, represents 2% to 5% of all oral fibrous proliferations. This lesion is characterized histologically by numerous giant stellate fibroblasts scattered within a fibrous stroma and its etiology has not been elucidated yet.

Aim: To analyze the clinical and pathological features of a series of 11 cases of GCF in pediatric patients.

Design: Eleven cases of GCF in pediatric patients were retrieved from the archives of the Department of Oral Pathology. The H&E

stained tissue sections were microscopically re-evaluated based on the following histopathological characteristics: Surface of the epithelium, shape of the rete ridges, location of the stellate cells within the lesion and inflammatory infiltration.

Results: Among the total of 11 cases of GCF the male to female ratio was 1.75:1 and the mean age of the patients was 7.3 years. More than half of the cases involved the gingiva (55.6%). Concerning the histological parameters, 63.6% of the cases presented lobular epithelial surface and mild inflammatory infiltration, while in 91% the epithelium exhibited elongated rete ridges. Finally, the stellate cells were mainly localized in the papillary lamina propria in 72.7% of the cases.

Conclusions: The diagnosis of GCF is based on the histopathologic criteria, while the clinical features are not pathognomonic. GCF should be included in the differential diagnosis of gingival tumor-like lesions on children.

P17-307

Chronic traumatic oral ulceration in children: report of two cases and literature review

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Introduction: The clinical differential diagnosis of chronic ulcerative oral lesions in children include a broad range of pathologic conditions. Eosinophilic ulcer (EU) in children older than 2 years old and Riga Fede disease (RFD) associated with natal/neonatal teeth are rare, benign, self-limited lesions that occur mainly on the tongue. Both EU and RFD show identical histopathological features demonstrating inflammatory infiltration with abundant eosinophils. The exact aetiology remains insufficient, but traumatic factors seem to be involved in their pathogenesis.

Case report: Two young patients 8 and 9-year-old respectively, with no medical history, were presented with a chief complaint of a slightly painful solitary lingual ulceration with elevated indurated borders, of more than one month duration. The history revealed a repetitive lingual trauma as a causative factor in both patients and the final diagnosis of EU was confirmed histologically. After elimination of the topical injurious factors, the lesions had completely resolved in a month's time. Additionally, both children were referred to a pediatrician to rule out any neurological disorder or self injurious behavior.

Comments: The literature review from 1902 up to now has revealed 50 cases of EU and RFD in children aged from just 1 week to 14-year-old. 78% of the lesions occurred on the tongue, whereas 20% of the children suffered from an underlying neurological disorder. Diagnosis and treatment management of these lesions are important and the pediatric dentist has to eliminate any causative agent, such as smoothing of sharp teeth edges or cover the teeth with silicone material.

P17-308

Locally aggressive dentigerous cyst in a six-year-old girlN. NIKITAKIS¹, S. MERKOURA¹, C. ALEXANDRIDIS² & L. PAPAGIANOULIS³¹Department of Oral Pathology and Medicine, Dental School, University of Athens, Greece; ²Department of Oral and Maxillofacial Surgery, Dental School, University of Athens, Greece; ³Department of Paediatric Dentistry, Dental School, University of Athens, Greece

Introduction: Dentigerous cyst, the most common type of developmental odontogenic cyst, is by definition located around an impacted tooth. It is usually observed during the 2nd and 3rd decades of life and more frequently involves mandibular 3rd molars. Dentigerous cysts are typically associated with a relatively limited growth potential. We report a case of a dentigerous cyst in a child exhibiting an unusual locally aggressive behavior.

Case report: A six-year-old girl was referred for evaluation of a mildly painful progressively growing enlargement of the anterior maxillary vestibule of one month duration. Clinical examination revealed a fluctuant, bluish soft tissue enlargement of the right anterior maxillary attached gingiva and alveolar mucosa along with expansion of the labial cortical plate. Radiographic evaluation revealed a large unilocular radiolucency causing root resorption of #52. Computed tomography showed cortical bone perforation and revealed the association of the lesion with the tooth germs of #11,12. Odontogenic tumors and aggressive cysts were considered in the differential diagnosis. The lesion was treated by enucleation and microscopic examination showed a typical dentigerous cyst with mild inflammation of the cystic wall without evidence of neoplastic change. During a 2-year follow-up period, no signs of recurrence were noted.

Comments: Dentigerous cysts rarely exhibit a locally aggressive behavior with cortical bone expansion and perforation. Moreover, occurrence in the anterior maxilla and during the first decade of life, are uncommon. Nonetheless, these lesions must be always taken into consideration in the differential diagnosis of unilocular radiolucencies around unerupted teeth.

P17-309

Papilloma of the palate – case report

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Introduction: Papilloma is a relatively frequent benign neoplasia of the lining epithelium which might be caused by human papilloma virus (HPV). It affects both sexes at ages between 30–50-year-old and more rarely children. Clinically, it appears as an exophytic, well circumscribed, pedunculated or nonpenduculad growth which is asymptomatic and made of small cauliflower-like projections. Its colour is white or white-pink, depending on the degree of keratinisation, and its size is 0.5 mm–1 cm. It is a solitary growth, localized on soft palate, tongue, gingival and cheeks. It is a differentially diagnosed from verruca vulgaris, condylomaacuminatum, verruciformxantoma, sialadenomapipliferum and others.

Diagnosis is made by histopathological examination showing a stratified hyperplastic squamous epithelium with a central nutrient pedicle. Treatment consists in surgical excision and monitoring.

Case report: A seven year-old boy came to our private clinic with a history of a four-month asymptomatic growth on the palate, in the region cervical to I6 upper molar, which was accidentally identified by the child with tongue exploration. Clinical intraoral microscopy examination revealed a 0.5 mm growth, well-circumscribed and of white-pink colour. It was decided to surgically excise the growth with diode laser; the growth was subsequently sent for further histopathological examination which confirmed the initial diagnosis of palate papilloma.

Comments: The aim of this paper is to inform the dentist about the clinical features of this benign tumour, in order to make an early and targeted diagnosis and, therefore, to offer the adequate treatment plan to finally relieve the patient.

P17-310

Effect of vitamin D3 on tight junction formation in a human keratinocyte cell lines

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Background: The molecular components of cellular tight junctions (TJ), including claudins, occludin and ZO-1/2, contribute to homeostasis in oral epithelialkeratinocytes. Many functions of keratinocytes are regulated by 1,25-dihydroxyvitamin D3 (D3), the active form of vitamin D3, that includes inhibition of proliferation, stimulation of differentiation including formation of the permeability barrier, and promotion of innate and adaptive immunity. However, the regulatory mechanisms between TJ molecules and D3 are as yet poorly understood.

Aim: To investigate how D3 affects the protein and mRNA expression of TJ molecules in keratinocytes.

Design: Properties of TJ molecules were analyzed by human epidermal keratinocyte cell lines, HaCaT and normal human epidermal keratinocyte, NHEK. Cells were grown in KGM or DMEM media supplemented with D3, calcium and the JNK inhibitor SP600125. Total RNA was extracted from the cells. Expression of claudin-1, -4, occludin and ZO-1 mRNAs in HaCaT and NHEK were observed by quantitative RT-PCR method. The immunofluorescence claudin-1, -4, occludin and ZO-1 in keratinocytes was performed employing anti-human claudin-1, -4, occludin and ZO-1 antibodies.

Results: The keratinocytes incubated with D3 induced upregulated expression of claudin-4 mRNA in a dose- and time-dependent manner. Incubation with D3 at any dose did not alter expression level of claudin-1 and ZO-1 mRNA. Immunofluorescence for claudin-4 was detected in keratinocytes incubated with D3.

Conclusions: These results indicate that expression of claudin-4 may be upregulated by the stimulation with 1,25-dihydroxyvitamin D3 in keratinocytes.

P17-311

Myoepithelioma of the palate in a child

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Introduction: Myoepithelioma is a rare disease because it refers to about 1% among all tumors of the salivary glands. It is well connected clinically with adjacent tissues, increases gradually and does not produce pain. All these characteristics make it difficult to conduct differential diagnosis. For the accurate diagnosis of myoepithelioma, combination of routine microscopy as well as immunohistochemistry are needed. Surgical treatment with wide local excision is the treatment of choice.

Case report: An eight-year-old girl was referred to the department of paediatric dentistry, Kyunghee University. She had a painless swelling of the left side of the palate. A well circumscribed, firm and submucosal nodule, measuring 2.5 cm in diameter, was observed in the transition between the hard and soft palate. Computed tomography revealed an increased soft tissue in the soft palate and no bone involvement was observed. The patient underwent a surgical removal of the tumor under general anaesthesia. Tumor well limited by capsule was separated and removed from the adjacent tissues, and palatal mucosa was excluded. Immunohistochemically, the plasmacytoid cells were diffusely and strongly immunoreactive for cytokeratin and S-100 protein. Most of the cells were also reactive for both vimentin and glial fibrillary acidic protein. As a result, we diagnosed as plasmacytoid myoepithelioma.

Comments: It is general principle to excise tumor widely to prevent recurrence. However concerning patient's age, only the lesion was excised to relieve pain and discomfort. During 18 months follow-up period, neither symptoms nor recurrences were observed.

P17-312

Oral manifestations of langerhans' cell histiocytosis: three case reports

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Introduction: Langerhans cell histiocytosis (LCH) is a non-malignant granulomatous, childhood disorder that is characterized pathologically by uncontrolled proliferation and accumulation of Langerhans' cells, mixed with varying proportions of eosinophils and multinucleated giant cell. LCH is a rare disease with an incidence of 5:1 000 000 more than 50% of all cases involves children younger than 15-year-old. Oral involvement is frequent and the disease simulates severe localized periodontitis. Radiograph features show localized or generalized bone loss, characteristic osteolytic lesions, and 'floating teeth' with no alveolar bone support.

Case report: Radiologic and clinical evaluation were performed with three cases (5 and 6-year-old boys and a 6-year-old girl) with diagnosis of LCH. All patients had chemotherapy (CT) treatment. The clinical findings common to all the patients were tooth mobility, painful and hemorrhagic gingival tissue and ulceration. Panoramic radiographs revealed extensive alveolar bone loss around upper and lower primary molar teeth with the appearance of 'floating teeth'. Treatment selected was the extraction of primary teeth with great mobility under the general anaesthesia in one of these patients. The parents received instructions regarding children's oral hygiene.

Comments: LCH's treatment consists of surgical excision, chemotherapy, radiation therapy or combinations of these treatment modalities. LCH affects dental development and chemotherapy may cause dental changes of varied degrees depending on the development stage and CT's dosage and duration. Therefore, in addition to adequate multidisciplinary care, long-term follow-up is needed for these patients for the possibility of LCH's recurrence.

P17-313

Clinical cases of oral mucosa pathology in early childhood

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Introduction: Pathologies of the oral mucosa occurring in early childhood may have a different etiology, acute or chronic course and present as a single or recurrent episode. The presence of pathology may be associated with developmental stage, general health status or caused by external factors. In healthy children, the immaturity of the oral mucosa favors the occurrence of traumatic lesions and changes associated with the development of the dentition. Pathology of the oral cavity with recurrent or chronic nature points to a general disease or malignant metaplasia and indicates the need for careful examinations in collaboration with a pediatrician. Clinical cases of oral mucosa pathology presented with the general health status of children under 2 years of age.

Case report: Epstein's pearls and Bohn's nodules in 5-month-old generally healthy infants. Congestive cysts in healthy newborns and eruption cysts: a generally healthy 12-month-old baby and 18-month-old baby (metabolic disease) with hyperplasia of the mucosa. Congenital epulis of the mandible in the anterior segment of generally healthy 4-month-old infant. Intraosseous melanotic neuroectodermal tumors of the maxillary jaw with the dislocation of the tooth bud 51 in a 4-month baby. Traumatic ulceration caused by the edges of erupting teeth in Riga-Fede's syndrome (sensory neuropathy, vasculitic neuropathy) and lower lip (hypogammaglobulinemia).

Comments: Knowledge of clinical patterns and pathogenesis of changes in the oral mucosa in young children can be helpful in early diagnosis of systemic pathology, or tumor growth and always requires careful diagnosis, often with the consultation of a pediatrician.

P17-314

Two cases presenting a dentigerous cyst treated with either marsupialization or enucleation

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Introduction: Our aim is to present the new diagnostic tools, treatment options available and their implications in orthodontic treatment in cases with dentigerous cysts found in the 4% of patients with at least one impacted, embedded or unerupted tooth.

Case report: A 28 years old lady with a cyst associated with an impacted maxillary canine and an 8 years old boy with a cyst associated with a palatally erupted maxillary mesiodens which caused the impaction of a lateral incisor, are presented. Diagnostic records, photos, panoramic and lateral cephalometric radiographs and CT scan were obtained. The first case was treated with marsupialization of the cyst and orthodontic traction of the canine after its eruption, while in the second case with enucleation of the cyst, extraction of the mesiodens, 6 months observation of bone regeneration followed by orthodontic traction.

Comments: Factors influencing treatment results are: (i) cyst size, (ii) adjacent anatomical structures, (iii) tooth type associated with the cyst, (iv) degree of tooth impaction, (v) patient's age (vi) degree of root apex formation. Enucleation is indicated when a supernumerary tooth is associated with the cyst and no likelihood of damaging anatomic structures such as apices of vital teeth, maxillary sinus, or the inferior alveolar nerve exists. However, cysts causing tooth displacement and involving loss of bone should be treated with marsupialization.

P17-315

Arteriovenous malformations of the oral region: our ten years experience

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Background: Arteriovenous malformations are benign congenital vascular anomalies of the arteriovenous system and they belong to the high-flow vascular malformations. Arteriovenous malformations are due to abnormalities of blood vessels morphogenesis and they grow by dilation of abnormal vessels. They are usually present at birth, they grow proportionately and they never regress. Factors like trauma, infection and endocrine changes trigger fast growth of the anomaly. Due to their size they are associated with skeletal alteration of the jaws. For the best assessment of the lesions

diagnostic exams such as Computerized Tomography and Magnetic Angiography are necessary. Depending on the size and the location the treatment includes embolization and immediate resection of the lesion.

Aim: The aim is to present our last 10 years experience in the management of the arteriovenous malformations of the oral and perioral region.

Design: Our data includes patient age, sex, anatomical location of the anomaly, indications for surgery, type of laboratory investigation, age at the time of treatment, complications and follow up period.

Results: During this period sixteen patients, five boys and eleven girls, were treated in our department. The mean age of the patients at the time of surgery was 7 years and the follow up period is 48 months. There were no complications and the histopathological exams confirmed the preoperatively diagnoses.

Conclusion: Although arteriovenous malformations are benign lesions they required prompt and methodological approach and management in order to avoid life threatening situations.

P17-316

Marsupialisation of odontogenic cysts of the maxilla in the paediatric patient

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Introduction: Surgery is the treatment of the different types of the odontogenic cysts of the jaws. Depending on the type and the size of the cysts, the surgical approaches include enucleation, marsupialisation, marsupialisation and at a second stage enucleation, enucleation with a peripheral osteotomy and localized or segmental resection. Marsupialisation is a very reliable technique and is the treatment of choice in managing extended cystic lesions of the jaws particularly in children and in medically compromised patients. This technique involves removal of the overlying mucosa and preparation of an opening into the cystic cavity. The potency of the opening is maintained with tubing or a gauze or an acrylic obturator. The most important advantage of the technique is the avoidance of damaging vital structures adjacent to the cyst such as permanent teeth during mixed dentition or nerves (inferior alveolar nerve). On the other hand the main disadvantage is the extensive treatment period and the high number of postoperative visits.

Case report: Two paediatric patients, a 7-year-old-boy and a 12-year-old girl were treated by marsupialisation of extensive odontogenic cysts of the maxilla. The stages of the treatment as well as the final results are presented.

Comments: The marsupialisation is a reliable technique for the management of odontogenic cysts in the pediatric population.

Poster Session P18/Jens O. Andreasen Awards 1

P18-317

Effects of clinical variables on the outcome of avulsed and replanted teeth: prognostic models for assessment

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Background: Previous clinical avulsion studies have not produced a model to predict prognosis.

Aim: To identify variables that reliably predict treatment outcomes and to develop a prediction model based on these variables.

Design: The study included 213 avulsed permanent teeth (one tooth/patient) treated between 1996 and 2007. Demographic, diagnostic and treatment information was obtained from the patients' records. Predictive power for each variable was assessed using a univariate logistic regression model. Only significant variables ($P \leq 0.05$) were considered and a c-index was calculated to assess predictive ability.

Results: Two models ('pure baseline' and 'initial treatment') were produced from the five variables holding the greatest predictive power (c-index): patient age (0.80) $P \leq 0.001$; stage of root formation (0.76) $P \leq 0.001$; storage medium (0.58) $P = 0.035$; tooth mobility after dressing (0.74) $P \leq 0.001$; tooth mobility after splinting (0.70) $P = 0.002$. These underwent multivariate analysis and the final models had high predictive abilities (c-index of 0.798 and 0.737), (c-index of 1.0 = perfect prediction).

Conclusion: The major factors influencing the outcome at 'pure baseline' were younger age, dry storage medium and immature roots. Outcome at 'initial treatment' stage was influenced by tooth mobility, either after splinting or after starting root canal dressing.

P18-318

Polish university students' knowledge concerning first-aid after dental injuries

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Background: Current literature emphasizes that awareness of appropriate triage procedures following dental trauma is unsatisfactory and that delay in commencing the treatment is the most influential factor affecting prognosis. Polish data are not available in this respect.

Aim: The aim of this survey was to establish the current state of knowledge with regard to first-aid procedures in cases of dental trauma of students at an academy of physical education and sport, compared with medical and general university students.

Design: In order to assess the knowledge, a self-completed questionnaire addressing definitions and first-aid measures in the case of tooth avulsion, was developed and distributed. The sample size consisted of 356 students attending the last year of university: sport academy–123 students, medical university–115 students, general university–118 students.

Results: Results revealed that just 3% of all students knew that in the case of dental avulsion immediate replantation should be performed. Only 6% of students were aware that the time factor after tooth avulsion is the single most influential factor affecting the prognosis. Only 16% of sport academy students and 23% of general university students knew the recommended transport medium for an avulsed tooth.

Conclusions: In the face of such poor knowledge, regarding dental injuries, there is an urgent need for adequate education programs on the subject of sport-related orofacial injuries directed at all sports students, including athletes, players and coaches, so they could offer immediate help at the site of an accident.

P18-319

Trauma in children: the Pahang experience

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Background: By age five, almost 35% of children would have sustained some form of dental trauma which affects their primary dentition. By the age of 12, at least 20% of children would have had some form of dental trauma.

Aim: To ascertain the distribution of traumatic injuries to the face and dental structures in children at a hospital in Malaysia.

Design: This is a retrospective study that involved data collection from treatment records of paediatric patients referred for the management of traumatic injuries. Data stratification was done based on the aetiology of trauma (fall, motor-vehicle accidents, assault, sports injury & animal bite), gender, age group (0–2, 3–6, 7–12, 13–16 years), type of trauma sustained (soft tissue, dento-alveolar & facial fractures) and treatment rendered.

Results: The main causes of traumatic injuries to the face and dental structures in children below 13 years of age is falls and the most common type of injury sustained is soft tissue injury. The main cause of injuries in children between 13 and 16 years of age is motor-vehicle accidents.

Conclusion: Facial fractures are more commonly seen in children above 7-years-old of age. However, facial fractures can also occur in new born babies when the delivery is traumatic or does not have any professional assistance.

P18-320

Pattern of traumatic dental injuries at the University College Hospital, Ibadan, Oyo State, Nigeria

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*Department of Child Oral Health, University College Hospital, Ibadan, Oyo State, Nigeria***Background:** Injuries to teeth and their supporting structures are common causes of referral to the dental clinic.**Aim:** This study aimed to assess the aetiology, type and the distribution of traumatic dental injuries (TDI) that presented to the Paedodontics clinic, U.C.H. Ibadan from April 2007 to April 2010.**Design:** Records of patients that presented within the above stated period were retrieved from the clinical daily records and information regarding TDI was extracted from the clinical notes in the patients' records.**Results:** Eighty patients were observed to have presented with TDI in the age range of 2–16 year-old with the mixed dentition age group (7–12 year-old) having the highest frequency (53.8%). Fall accounted for 82.5% of all causes of trauma and the home was the commonest place of occurrence. The maxillary incisors were the most frequently involved teeth in both primary and permanent dentitions with complicated crown fracture being the most prevalent type of injury occurring in 42.5% of cases. Time of referral to the dental clinic ranged from few hours to years and 84.3% of cases were late in their treatment. The younger age groups sought treatment significantly earlier than the older age group ($P = 0.001$). The longer time to seek treatment ($P = 0.003$) and the severity of the trauma ($P = 0.015$) were found to be significantly associated with the complexity of the treatment provided.**Conclusions:** Public awareness on the importance of close monitoring of the activities of children, especially in mixed dentition age and early presentation of TDI, is necessary to reduce complications and cost of management.

P18-321

Late re-implantation of two immature permanent incisors one month after a serious accident

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*School of Dentistry, Aristotle University of Thessaloniki, Thessaloniki, Greece***Introduction:** The goal of restoring the mouth to its original condition should make us always to take into consideration this technique of late re-implantation of avulsed teeth.**Case report:** In this case, an 8-year old boy had a serious life-threatening accident at school, and the two permanent upper central incisors were avulsed. The roots were not completely formed. One month after the accident the child was discharged from the hospital. It was decided to try to reimplant his own teeth as the best interim solution for a few years. A long preparation took place with the teeth being root canal treated and obturated

with gutta-percha, the necrotic periodontal ligament being removed, and the teeth being immersed in sodium fluoride and chlorhexidine solutions. Then, the teeth were surgically replanted under local analgesia. A bone bur was used in order to prepare the bony walls of the sockets. The teeth were placed and stabilized by the use of interrupted vertical mattress sutures. In addition a rigid splint was placed for 12 weeks. The teeth are in place for 2 years. Some root resorption is now in place on the 21.

Comments: Re-implantation of his own teeth was preferred, although it could not be a permanent solution in order to achieve the most aesthetic and functional result for as long as possible, and to avoid a catastrophically large defect in the alveolar bone.

P18-322

Root fracture and avulsion of a young permanent tooth. Follow-up 2 yearsJ. HASSI¹, G. NAREA², M. RIQUELME² & X. VIDAL³¹*Department of Paediatric Dentistry, Dentistry Faculty University of Chile, Chile;* ²*Department of Maxillofacial Surgery, Dentistry Faculty University of Chile, Chile;* ³*Maxillofacial Radiology Service, San Borja Arriaran Hospital, Chile***Introduction:** Dentoalveolar trauma in young permanent teeth constitutes a challenge from the therapeutic point of view. Correct diagnosis, follow-up and experience are determinant in prognosis of traumatized teeth. This is a case report of a dental trauma in the young permanent dentition.**Case report:** A 7-year-old patient ASA1 with severe facial trauma was referred to the maxillofacial surgery unit of Melipilla Hospital in Chile after 24 h of the trauma. He was uncooperative and the determined treatment was done under general anesthesia. In the operating room the diagnosis was lateral luxofracture of tooth 11 and apical root fracture and avulsion of tooth 21. During intubation maneuvers, the incisors of the mandible were subluxated. We decided to remove the fractured apical segment of 21 due to impossibility of appropriate reduction and in order to obtain stability. The area was sutured and the teeth were fixed with a semi-rigid splint for 4 weeks. At discharge, antibiotherapy and pain management were applied. The prognosis was poor for the fractured tooth and good for the rest. During the follow up the eruption of the teeth continued. At clinical examination in the follow up of 2 years the tooth was esthetically and functionally appropriate, the vitality tests were positive and radiographically we found marked root resorption and root dwarfism.**Comments:** IADT guidelines for luxofractures, root fractures and avulsions along with the late consultation establish a different therapy to the performed and poor prognosis. The removal of the apical segment could have eliminated the epithelial root sheath, because there was no continuity in root formation and substitution healing occurred. Determinants elements in our case were the high compromised family, the infrastructure of our unit and the clinical experience of the team.

P18-323

In-vitro investigation of tooth discolouration with different intracanal materials used in dento-alveolar trauma

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Background: Pulpal necrosis and subsequent endodontic treatment is a common sequelae following dento-alveolar trauma. One cause of tooth discoloration can be the intracanal materials used for subsequent endodontic treatment. A multi-centre randomised controlled trial following avulsion and replantation found Ledermix[®] causes a significantly less acceptable outcome to patients with respect to discoloration.

Aim: To identify which constituent of Ledermix[®] is responsible for the tooth discoloration. To compare the degree and progress with time of tooth discoloration caused by Ledermix[®] and other endodontic materials commonly used following dento-alveolar trauma.

Design: Following a power calculation, ninety ovine (lamb) mandibular incisors were divided into nine groups. The root canals were instrumented, irrigated and obturated with the test materials. The medicaments used included Ledermix[®], Odontopaste[®], MTA, Calcium hydroxide, and Gutta-percha with sealer. A laboratory-made Ledermix, Demeclocycline, Triamcinolone, Ledermix base paste were also studied. Tooth colour was quantified by computer analysis of digital images taken at specified time intervals using the CIELAB colour space. Statistical analysis was carried out (ANOVA and Independent T-test).

Results: Discoloration progressed over the 24 weeks study. Ledermix[®], laboratory-made Ledermix and Demeclocycline showed a statistically significant dark grey discoloration ($\Delta E = 36.13, 37.60, 33.31$) whereas Gutta-percha with sealer demonstrated a yellow discoloration ($\Delta E = 9.71$). MTA showed a mild but significant grey color change ($\Delta E = 4.48$). No significant discoloration was demonstrated by the remaining groups.

Conclusions: Both Ledermix[®] and MTA caused grey tooth discoloration, whereas gutta-percha with sealer caused a yellow discoloration. Demeclocycline is the active tetracycline in Ledermix[®] and was responsible for severe tooth discoloration.

P18-324

The simple and effective splint method for traumatized teeth

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Introduction: The outcomes of dental trauma are affected by the initial management. We previously demonstrated the effectiveness of our original semi-rigid splint method in the treatment of dental trauma by conducting several animal researches. Also we used this method for various dental traumas for approximately 20 years at

clinical settings. The purpose of this presentation is to introduce our simple and effective splint method.

Case report: A four-year-old boy came to our clinic approximately 2 h after suffering a severe lateral luxation on his maxillary left primary central and lateral incisors. We repositioned and splinted injured teeth with our method using flowable resin and elastomeric chain. The successors of the injured teeth erupted after 3 years from his first visit and no particular findings were recognized. Additionally, an eleven-year-old boy came to our clinic about one week after the intrusion and crown fractures of both the maxillary central permanent incisors. Although his injured teeth had already been repositioned and splinted by a rigid method, we changed the splint method to ours because he had been feeling pain on the teeth. Two years after undergoing the initial treatments, his injured teeth are still in a good outcome.

Comments: Our method is effective especially for infants and uncooperative patients because attachment and removal of the splint is very simple and speedy. In addition, one of the advantages of our method is that dentists can confirm the status of healing of injured teeth without removing the splint.

P18-325

Tooth avulsion. A RCT on replantation of teeth with extra-oral dry time > 60 minutes

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Background: A widespread lack of knowledge about the immediate management of tooth avulsion results in an extended extra oral dry time, which leads to an increase of complications.

Aim: This study aims to assess what should be the endodontic approach in the case of replantation with extraoral dry-time > 60 min.

Design: Thirty nine patients were selected, in the period January 2004–December 2010, that had a dental element with extra-oral time > 60 min but less than 24 h. Randomization was performed so as to divide the population into two groups. Group 1, extra-oral endodontic therapy and subsequent replantation. Group 2, replantation and subsequent endodontic therapy in 7–15 days. Clinical and radiographic evaluations were carried out.

Results: All 36 patients showed a similar trend between the two groups; at the time of splint removal clinically a reduced mobility was observed which was physiological after one month. Radiographically the trend was more variable, initially because there was an increase in resorption processes dependent on the group. After 2 and at 4 years, the resorption was similar for both groups.

Conclusions: Extraoral endodontic therapy initially appeared to improve the results, but at 4 years this tend to equalize with the other group. These data allow us to conclude that both procedures result in by root resorption, but both still allow the retention of the element in the dental arch, thus preserving the space and the soft and bonnie tissue.

P18-326

Prevalance of dental trauma in schoolchildren from Plovdiv, BulgariaA. BELCHEVA¹ & M. MANOLOVA²¹*Department of Paediatric Dentistry, Faculty of Dental Medicine, Medical University, Plovdiv, Bulgaria;* ²*Department of Operative Dentistry and Endodontics, Faculty of Dental Medicine, Medical University, Plovdiv, Bulgaria***Background:** There are no data in the prevalence of dental trauma in Bulgarian schoolage children.**Aim:** To investigate the prevalence of dental trauma in 7–11-year-old children in Plovdiv, Bulgaria.**Design:** The present study included 2572 children 7–11-year-old. Only upper and lower incisors were examined, in the classrooms at daylight. Treatments of the fractured teeth were also registered.**Results:** The prevalence of crown fractures of permanent teeth was 8.67%. The crown fracture prevalence in boys was significantly higher than girls. Most of the children had only one fractured tooth (82.96%). The greatest number of fractured teeth were located in the maxilla (88.20%). Most often the fractures involved only enamel or enamel and dentine while complicated crown fractures with pulpal exposure were found in 5.32%. Most of the fractured teeth were left untreated (84.79%).**Comments:** The results of this study showed a high prevalence of untreated traumatized teeth in school age children. As expected maxillary teeth were more often affected by fractures. The importance of educating this population about trauma treatment is of high priority.

P18-327

Management of dental traumatic injuries to permanent dentition-an informed approach

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*Paediatric Dentistry and Orthodontics, Faculty of Dentistry, Prince Philip Dental Hospital, The University of Hong Kong, Hong Kong SAR, China***Introduction:** Fractured, displaced, or avulsed teeth are the most commonly occurring dental traumatic injuries (DTIs) in children. These injuries cause pain, impair masticatory function, speech, and compromise esthetics, thus affecting the child's overall quality of life. The child's age, severity of injury, and appropriate treatment and follow up, using the recommended guidelines and procedures, are critical for successful treatment.**Case report:** A 9-year-old Chinese boy presented with avulsion and intrusion injuries to his permanent maxillary central incisors, 90-minutes following a fall at school. His medical history was non-contributory. Tooth 21 was re-implanted, and teeth 21 and 11 were treated endodontically with calcium hydroxide placed in the root canal. Consequently, tooth 21 exhibited external root resorption, and after 21 months only the cervical third of the root had remained. In the presence of the patients existing malocclusion teeth 11 and 21 were extracted as part of a multidisciplinary treatment plan with the option of using the lateral incisors to replace the central incisors and canines to replace the laterals.**Comments:** Despite the availability of several management options, there appears to be no guaranteed outcome for DTIs. Each child is an individual with specific treatment needs, which necessitates a different treatment plan based on the type of traumatic injury encountered. This case highlights, that the treatment outcome patterns of DTIs are unpredictable and, a multi-disciplinary informed approach, as in this case, may result to a more predictable outcome.

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Management of central incisor avulsion with reimplantation: case report

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*School of Dentistry, Aristotle University of Thessaloniki, Greece***Introduction:** Tooth avulsion is often the result of trauma in young ages and its management remains a challenge. The objective of this presentation is to report a trauma case involving the avulsion of a permanent central incisor and its management with 13 hours extra-oral time.**Case report:** An 8-year-old girl suffered facial trauma and as a result, avulsion of 21 occurred. The tooth had a fully shaped root with open apex (> 1 mm). Reimplantation was performed after the tooth had remained 2 hours in dry air and 11 hours in a glass full of ice cubes in a freezer. Before reimplantation, sterile isotonic saline was used for intensive rinsing of the tooth and the socket. The tooth was splinted for a period of 20 days. At the 6-month recall, reaction to cold stimuli as well as color were normal whilst mobility was increased. At the radiographic examination there was no sign of root resorption.**Comments:** This case report indicates the revascularization ability of permanent teeth with open apices, even when tooth root has reached its full length. This ability may remain for several hours after the accident, and the need for endodontic treatment may not always be mandatory. The case will be followed despite the positive clinical outcome of the avulsed tooth in the first 6 months, long follow up process is needed to establish success. Finally, on the practical side, freezing of avulsed teeth might be a potential mean of tooth preservation until reimplantation is possible.

P18-329

Complications after use/non-use of IADT-guidelines for dental traumaK. BÜCHER¹, C. NEUMANN², R. HICKEL¹ & J. KÜHNISCH¹¹*Ludwig-Maximilians-University, Munich, Germany;* ²*Private Practice, Erding, Germany***Background:** Insufficient or false treatment of dental trauma may result into complication or even tooth loss. In 2001 and 2007 the International Association of Dental Traumatology (IADT) published guidelines for best practice treatment on basis of current expertise and scientific knowledge for dental trauma.**Aim:** This retrospective study aimed to (i) characterise treatment regimen and complications of a dental trauma population (ii) correlate complications to treatment-conformity with the valid IADT guidelines.**Design:** A population of 216 patients (1–68 years; 139M/77F) with 361 traumatised teeth was seen at the Emergency Service of the Department for Conservative Dentistry from 2004–2008. Patients' records were reviewed regarding treatment and complications. Complications were related to treatment-conformity with IADT-guidelines. Ethical approval was obtained by the Ethical Committee of the Medical Faculty (Project-No. 390-09).**Results:** Of the 361 teeth, 89.1% were treated accordingly to the IADT guideline and 6.2% of teeth could not be allocated to either group. University-dentists adhered to the guidelines most often, followed by other clinics and private practices. In 55 teeth (15.2%) a number of 84 complications were registered. 12.4% of the cases treated accordingly to guidelines as 47% that did not had complications.**Conclusions:** (i) There is insufficient application of the current treatment guidelines (IADT) outside the university-setting. (ii) Treatment that does not confirm to the IADT guideline could be linked to a higher rate of complications. In conclusion, further promotion of the treatment guidelines according to the IADT is advisable.

P18-330

Gingival expression of SOD and NOS mRNA in NOS1 knockout mice

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Background: Active oxygen and free radicals play an important metabolic role in cells and tissues. However, little is known about the morphological dynamics of their related enzymes in gingiva.

Aim: We investigated gingival mRNA expression of active oxygen-scavenging and free radical-synthesizing enzymes in normal and neuronal nitric oxide synthase (NOS1) knockout (KO) mice to elucidate their mutual dynamics.

Design: Five-week-old normal and NOS1 KO mice were used. mRNA expression in their gingiva was investigated by *in situ* hybridization.

Results: In normal mice, NOS1, manganese superoxide dismutase (Mn-SOD) and endothelial nitric oxide synthase (NOS3) mRNAs were positive in the lamina propria mucosae, although the signal of NOS3 mRNA was weak. Mn-SOD and NOS3 mRNAs were also positive or weakly positive just below the horny layer. Inducible nitric oxide synthase (NOS2) mRNA was negative in all tissues. NOS2 and NOS3 mRNAs were strongly expressed in the basal cell layer in KO mice. Furthermore, NOS3 mRNA was also expressed in the lamina propria layer.

Conclusions: These findings suggest that NOS2 and NOS3 compensate for NOS1 in the gingiva under NOS1-deficient conditions.

P18-331

Revascularisation of non-vital immature permanent teeth

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Introduction: Revascularisation of necrotic pulps has been reported as a conservative treatment option for non-vital permanent teeth with immature roots. Revascularisation aims to promote apexogenesis in order to achieve continued root development and thickening of dentinal walls. The technique may improve the long-term prognosis and outcome for these teeth, compared to that achieved with either calcium hydroxide or with an apical plug of MTA.

Case report: Two children with a history of dental trauma were referred to the Paediatric Dentistry Department for endodontic management of non-vital immature permanent teeth. Case 1: A 9 year old boy presented with a non-vital immature central incisor which had sustained an uncomplicated enamel-dentine crown fracture. Case 2: An 11 year old boy presented with a discoloured and symptomatic, non-vital immature lateral incisor with a dens invaginatus which had history of concussion. Management involved placement of a triple antibiotic paste as a root canal dressing, followed by a revascularisation technique. Coronal seal was achieved with a plug of mineral trioxide aggregate in the coronal portion of the root canal, followed by placement of a composite restoration. At 12 months follow-up, both teeth were asymptomatic and exhibited radiographic signs of periapical healing and continued root development. Some evidence of post-operative tooth discolouration was evident at review.

Comments: Revascularisation may provide optimal treatment outcomes for non-vital immature teeth. Patient satisfaction with the technique is reported as high.

P18-332

Reevaluation of knowledge in dental traumatology in educators and caregivers of children with special needs

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Background: The prevalence of dental traumas in children with special needs is higher than the one of normal children. These patients spend most of their time life in special schools where caregivers not only teach them, but also take care of them. For all these reasons the professionals involved in this task should have enough background knowledge about dental trauma.

Aim: To evaluate the knowledge of educators of children with special needs in dental traumatology, before and after giving them a lectures about the management of dental trauma.

Design: We carried out a survey to teachers and caregivers working at schools of children with special needs. After one year we have given them a lecture explaining the best management of the dental trauma in patients with special needs; we want to reevaluate their knowledge after that lesson.

Results: After visiting school of special education, we have observed that the teachers have a poor knowledge about dental trauma. After our lesson, their knowledge have been increased.

Conclusions: (i) The prevalence of dental trauma in children with special needs is high. (ii) It is necessary further training of parents and educators both in preventive and emergency management in dental trauma. (iii) Dissemination of protocols on the environment is needed.

P18-333

Multidisciplinary treatment of primary incisor intrusion sequela to permanent successor

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Introduction: Traumatic injuries may effect dental development of the children. These injuries may cause esthetic and functional problems at the permanent dentition. The close relationship between the apex of the primary teeth and the permanent incisors is accepted as the source of the problem especially in the intrusion. Delayed eruption, malformations, enamel hypoplasia, crown and root dilacerations may be observed in permanent dentition after primary incisor trauma. In this case report, the impact of the primary teeth trauma on the permanent dentition and the multidisciplinary treatment options are presented.

Case report: A healthy nine-year-old girl was referred to Paediatric Dentistry Department with the complaint of delayed eruption of the maxillary right central incisor (11) and enamel discoloration on the maxillary right lateral (12). There was an intrusion trauma history at the age of 3 years. The intra-oral and radiographic examinations were showed that abnormal crown and root formation in 11 and enamel hypoplasia at 12. Extrusive orthodontic movement 11 was accomplished with a bonded button, elastic ligatures and an appliance. After extrusion of 11, both 11 and 12 were restored with composite resin. After a 12-month treatment period, both 11 and 12 were functional and esthetically acceptable.

Comments: The paediatric dentist is the major responsible in the multidisciplinary treatment of the children dental trauma. Examination and treatment plan have to be compatible with patient's expectations. Clinical and radiographic follow-up are mandatory after trauma.

P18-334

A retrospective analysis of tooth transplantation in a paediatric population at Leeds Dental InstituteV. KAFOUROU¹, P. FRANCIS DAY¹, J. SPENCER², N. HOUGHTON², T. MUNYOMBWE³ & M. DUGGAL¹¹*Department of Paediatric Dentistry, Leeds Dental Institute, University of Leeds, UK;* ²*Department of Orthodontics, Leeds Dental Institute, University of Leeds, UK;* ³*Department of Biostatistics, Leeds Dental Institute, University of Leeds, UK***Background:** Long term replacement of anterior teeth lost due to trauma is a challenge for the clinician.**Aim:** The aim of this study was to investigate the outcomes of tooth transplantation in a paediatric population at the Leeds Dental Hospital.**Design:** Data was collected from 75 patients with 90 transplanted teeth. Donor teeth were classified according to the stage of the root development. Clinical and radiographic outcomes for PDL healing and pulp revascularization were recorded and related to prognostic factors.**Results:** The mean age of transplant placement was 13.2 years and the follow-up observation period ranged from 1–9 years. Main reason for autotransplantation was dental trauma (81.2%). In 50% of the transplants endodontic treatment was electively commenced because of the advanced root development of the donor tooth. 75.6% of cases, where revascularization was expected presented signs of pulp revascularization.Revascularization was significantly ($P = 0.001$) related to the stage of root development of the transplant. 87.6% of the transplants exhibited complete PDL healing, while 13.5% showed signs of replacement resorption. PDL healing was significantly related to the stage of root formation at the time of the surgery ($P = 0.004$), the ease of handling and placement of the graft at the recipient site ($P < 0.001$), the status of the alveolar bone ($P < 0.01$) and the skill of the operator ($P = 0.004$). Overall success of tooth transplantation was 87.6% and overall survival rate was 94.4%.**Conclusion:** Tooth autotransplantation procedures carried out by a multidisciplinary team in a paediatric population at the Leeds Dental Institute demonstrated a high success and survival rate.

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Oral health status and its related factors of 0–6 year-old children with developmental delay

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Background: Approximately 0.3% of children, less than 6-year-old, in Taiwan present with developmental delay. They may have a greater risk for poorer oral health than ordinary children, and need to be surveyed.

Aim: The purpose of this study was to analyze the oral health status and its related factors in children with developmental delay.

Methods: A total number of 132 out of 155 children with developmental delay in six early intervention institutions and preschools with purposive sampling were surveyed. The oral health status was examined by dentists, and the related factors were collected by self-administration structured-questionnaire, completed by their parents or caregivers. The database was designed using MS Access and data were analyzed using SPSS and JMP7.0 ($P < 0.05$ was statistically significant).

Results: The mean age of subjects was 4.21 ± 1.12 years old, the number of boys (63.64%) were more than girls (36.36%). The average dt, et, ft and deft index were 2.08 ± 2.98 , 0.24 ± 0.77 , 0.63 ± 1.33 , and 2.86 ± 3.54 respectively. Caries prevalence and filling rate was 40.48% and 53.03%. Boys had higher caries prevalence than girls with statistical significance ($P = 0.0086$). The deft index was increasing with age ($P = 0.0496$).

Conclusion: The oral health status of children with developmental delay is characterized with more decayed teeth and less filled teeth number. The related factors of deft index and caries prevalence included: age, parent's education level, children's oral hygiene habits, dental visit experience and caregiver's oral health attitude.

Delayed tooth eruption in a patient with cerebral palsy

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Introduction: Patients with cerebral palsy (CP) often present functional disturbances on arch form and occlusion. However, reports on the impact of dysfunctional behavior on tooth eruption in patients with CP are not available. The aim of this report was to present the dentofacial characteristics and treatment approach of a patient with CP with an emphasis on the failure of tooth eruption.

Case report: A 12-year-old girl with CP was referred to the Department of Orthodontics. The medical history revealed preterm birth, epileptic episodes and moderate mental retardation. The extraoral examination revealed a convex profile with retruded mandible, slight facial asymmetry, lip incompetence, mouth

breathing and orbital hypertelorism which are common characteristics among CP patients. Intraorally, a Class II/1 was recorded along with increased overjet, generalized spacing and delayed tooth eruption. The patient reported soft diet and mastication only on the left side. The treatment plan included initially an upper Hawley appliance for space closure followed by an activator for mandibular advancement. The progress orthopantomogram (age of 15) revealed multiple impactions of permanent teeth and odontogenic cysts. Consequently, surgical removal of the cysts and guided extraction therapy were performed to enhance the possibility of eruption of the permanent teeth.

Comments: The facial asymmetry and the more severe tooth eruption delay on the right side are possibly due to patient's unilateral mastication. Fixed appliance therapy and traction of the impacted teeth would have been more appropriate but that was not an option at that point, given the poor oral hygiene and lack of cooperation.

P19-337

Clinical, odontological, epidemiological aspects and their correlations from oncological pediatric patients

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Cancer is the second biggest cause of infantile death (11%), coming behind accidents (45%). Among the main kinds of neoplasms which affect children, part of them are leukemias (30.20%) commonly acute lymphoid (75%), central nervous system tumors (21%) and lymphomas (10.90%). The therapeutic modalities applied on neoplasms, enclorosechemotherapy, radiotherapy, bone marrow transplant and surgery. The most appealing oral complications in oncological patients are: Mucosities, Xerostomia, Radiation Caries, Osteoradionecrosis, bleeding, bacterial, fungal, virus infection and systemic difficulties: plaquetopenia, neurotoxicidade and muscle trismus. In several cases it is necessary: Decreasing or suspending the chemotherapy sessions; breaks during radiotherapy sessions and hospitalizing the patient. Breaks during the treatment, increase the tumor proliferation, risking the tumor control and global rate surviving. Due to these adversities, entrust the importance of the early dental entourage in oncological patients, forwarding prevention and/or odontological treatment to decrease the interruption of the treatment and secondary infections rates, effecting the results of the base treatment although of great importance to patients multidisciplinary approach. In this study, we described the most frequent oral complications in pediatric oncological patients during chemotherapy and/or radiotherapy correlating them to the social, economic, cultural level and the kind of neoplasm from the patient, to select risk groups for preventive intervention. This is a transversal study, carried out through handbook analysis and variable descriptive analysis: Type of neoplasm; oncological therapy; type of residence; type of oral lesion; *Qui-quadrado* test is used and the level of significance used is 5%.

P19-338

Clinical study of oral mucosal lesions in children and adolescents: twenty years' experience

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Background: More than 200 separate pathologic entities could affect the oral cavity of adult patients. Theoretically, any of these lesions and pathoses can also occur during childhood. However, the exact prevalence of oral mucosal lesions in children is controversial due to a lack of standardized diagnostic methods.

Aim: To investigate the relative sequence of the various oral mucosal lesions in a Greek paediatric population.

Design: All the cases concerning children (age < 18 years) were retrieved from the archives of the Department of Oral Medicine and Pathology, School of Dentistry, Athens, between 1990 and 2010 and all the information regarding age, gender and clinical diagnosis was collected from the patients' records. Furthermore, the various oral lesions were classified according to the MIND algorithm (Jacobsen P. & Carpenter W., 2000) into Metabolic, Inflammatory, Neoplastic and Developmental diseases.

Results: Among 15,041 cases, 604 cases (4%) concerned pediatric patients. The female: male ratio was approximately 1:1 and the age ranged between 0 and 18 years (mean age 11.8 years). Among the total of the cases, 506 (83.8%) represented inflammatory or traumatic lesions, 77 (12.7%) developmental disorders, 18 (3%) neoplasms or tumor-like oral lesions and, finally, only three cases (0.5%) concerned metabolic diseases. Interestingly, mucocoeles and herpetic gingivostomatitis were the most common entities, 111 (18.4%) and 67 (11%) respectively.

Conclusions: The classification of oral lesions in pediatric patients still provokes difficulties and diagnostic dilemmas. Our study highlights the striking variety of mucosal lesions during childhood underlining once more the need for a globalized evaluating system.

P19-339

Docteurs Sourire-a 4 years dental care program for Romanian underprivileged children

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Background: Our project emerged from the fact that in Romania special needs and socially deprived children, have little access to dental care.

Aim: To assess and improve oral health of underprivileged children.

Design: 'Docteurs Sourire' is a dental care program for Romanian children that had little/no access to such services. Based on

volunteer work of French and Romanian dentists, the project started in 2007. Hundred and ninety six underprivileged children and youngsters (4–26-year-old, 123 mentally challenged, 128 institutionalized) were examined and treated (2007–2010) in dental offices organized in day-care centers for disabled children in Cornetu-Ilfov and Suceava. Follow-up and further treatment for previously treated children from Cornetu was provided every year. Six children requiring GA were treated in a children's hospital in Bucharest (2009). Patients and caregivers were instructed on oral hygiene means and techniques according to the kids' abilities and perception.

Results: Examination revealed high need for dental care and very few or no previous treatments. Most of the kids allowed themselves to be treated under common dental office circumstances. Project outcomes: (i) noticeable improvement of patients' oral status, hygiene and cooperation; (ii) young dentists got used to working with special needs children.

Conclusions: (i) Availability of dental services for underprivileged children and youngsters in Romania is still far from meeting the actual needs. (ii) Disabled patients can often be treated under common dental office circumstances. (iii) Prevention programs targeted on these patients could help improve oral health and therefore decrease the needs, complexity and costs of treatment.

P19-340

Loss of primary dentition and failure of tooth eruption in a patient with cerebral palsy and bruxism: a case report

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Introduction: Cerebral palsy (CP) comprises a group of movement and postural development disorders that cause disability, and which originate during development of the fetal brain. Bruxism has been reported to exist in many children with cerebral palsy.

Case report: A 5-year-old female was presented due to generalized discomfort in the mouth. Clinical and radiographic examination revealed root resorption of the severely abraded primary molars, unerupted permanent molars and incisors. Under general anesthesia extraction of primary teeth was carried out and gingivoplasty of the gingiva covering the permanent molars was performed with electrosurgery. The extracted teeth were submitted to microscopic examination revealing foci of dentin abnormalities and external resorption.

Comments: Developmental enamel defects in primary teeth have been found at least twice as frequently in children with CP especially of prenatal origin (Bhat and Nelson, 1989). This, along with excessive bruxism, maybe the reason for the disturbed exfoliation of abraded primary teeth and failure of tooth eruption of the posterior teeth.

P19-341

Cystic fibrosis. Oral manifestations and treatment concerns

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Introduction: Cystic Fibrosis is an autosomal recessive disorder with many different symptoms caused by abnormal viscous secretion from most exocrine glands. The lungs are invariably involved and there is a non-productive cough that leads to acute respiratory infection. Involvement of the pancreas results in obstruction and gland atrophies. Confirmation of the diagnosis may be made by the family history, chronic pulmonary involvement and the absence of pancreatic enzymes. Treatment is only symptomatic.

Case report: A 6-year-old male patient diagnosed with C.F is presented. The patient had no caries or enamel hypoplasia in the first permanent molars. Mouth breathing and bad oxygenation of peripheral blood caused gingivitis.

Comments: Dental Management of these patients should be based on a clear understanding of the pulmonary involvement and a strict oral hygiene program. During respiratory infection or gastrointestinal complications only emergency dental treatment is recommended. Changes in salivary excretion, chronic medication and a diet rich in carbohydrates may predispose to caries, while antibiotic coverage is often frequent. Children with C.F. have not been shown to have a higher caries prevalence, possibly due to *MS* suppression. Routine dental care can be provided as long as the systemic condition of the patient is under control. General anesthesia should be avoided in view of the respiratory condition. Cirrhosis of the liver may result in a defect in the clotting mechanism and consequent bleeding following extractions.

P19-342

Protocol of dental approach to children and adolescents with insulin dependent diabetes mellitus (Type 1 DM)

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Background: Diabetes mellitus is a chronic metabolic disorder where significant oral complications have been reported mostly due to chronic hyperglycemia.

Aim: It is necessary, because of the increased prevalence of type 1 DM (global average annual increase is 3.0% per year) in children and adolescents, to establish a protocol of dental approach for these young patients aiming to their dental prevention and treatment.

Method/Design: According to the literature, the most frequent oral signs and symptoms of diabetes mellitus are gingivitis, periodontitis (alveolar bone loss even early in life), xerostomia and dental caries.

Results/Protocol: The objective for young patients with type 1 DM is to maintain blood glucose level as close to normal as possible. As a consequence, a pre-session assessment is appropriate and should be based on medical records. Dentist should be aware of the duration of diabetes, recent level of glycated hemoglobin assay (Hb1c), insulin regimen (multiple daily insulin injections or continuous subcutaneous insulin infusion), and other possible co-existent medical conditions such as thyroid or celiac disease. Dental appointments must be scheduled 1–2 hours after insulin intake so that they do not coincide with peaks of insulin activity and should be accomplished at the least time and under the less stressful conditions. It is also important for clinicians to check patient's blood glucose level before every dental session. Moreover, patients with type 1 diabetes mellitus should not undergo dental treatment with Nitrous oxide. In case of poor co-operation, general anesthesia is suggested where pre-operational stabilization of patient's blood glucose level is necessary. Dental prevention is important for these young patients in order to avoid oral complications; therefore, frequent recall visits are required, concerning professional tooth cleaning, topical application of fluoride and oral hygiene instructions.

Conclusions: Dentists should be familiar with the medical management of children and adolescents with type 1 DM, as they are responsible in motivating them to maintain a rigorous oral hygiene.

P19-343

Prevalence of dental caries in juvenile idiopathic arthritis in Russia

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Aim: The aim of this study was to verify the dental abnormalities and the oral health condition in children with juvenile idiopathic arthritis (JIA).

Design: Caries indicators were studied at 119, 4 to 17-year-old children. Indices recorded were: dental caries (DMFT), bacterial dental plaque (OHI-S), gingival inflammation. These recordings were obtained also for matched controls.

Results: There was significant difference in dental caries experience and mean plaque score between children with JIA and controls. For children of all age groups with systematic form of disease the caries prevalence was 100%. For children with articulate form of disease, caries prevalence was 74%, for <6 years, 89% for 7–12 years, and 98% for 13–17-year-old children. Children with JIA in permanent dentition, had significantly greater gingival idencies, compared to the controls ($P = 0.05$). Significant levels of untreated caries and increased levels of missing teeth were found in the JIA group.

Conclusions: The low caries rate was attributed to the fact that children with JIA had received preventive dental care from an early age patients with JIA had less restorative dental treatment, with tooth extraction often the chosen option for the treatment of dental decay.

P19-344

Oral health status in adolescents with chronic pyelonephritis

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Introduction: Chronic pyelonephritis is a chronic destructive inflammation in the tissues of kidneys in most cases accompanied by hyper parathyroidism, which in turn leads to the phenomena of acidosis throughout the body.

Objectives: The aim of this study was to investigate dental abnormalities and the oral health status in adolescents with chronic pyelonephritis.

Design: Sixty teenagers with chronic pyelonephritis aged 12–16-year-old were examined. The group included 26 patients with the acute disease and 34 patients in remission. The one control group consisted of 40 healthy adolescents of the same age. Dental caries was assessed using the DMFT index; oral hygiene was assessed using the OHI-S index.

Results: The mean DMFT index (5.6) in teenagers with chronic pyelonephritis in acute and remission stages, did not differ significantly but was significantly higher than in healthy controls (DMFT = 2.5). Enamel hypoplasia was found in 28% of teenagers with pyelonephritis and in 13% of teenagers in the control group. The OHI-S index showed a statistically significant correlation with the stage of the kidney disease. Average value of the OHI-S index in teenagers in remission was 2.8 while in teenagers in acute stage 4.1. The mean OHI-S in the control group was 2.4.

Conclusion: Patients with chronic pyelonephritis have more enamel hypoplasias and dental caries. This should be taken into account for the application of appropriate preventive and therapeutic measures.

P19-345

Neurofibromatosis type I, leukemia and hematopoietic stem cell transplant: 5 year dental management in a teenager

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Introduction: Neurofibromatosis type I is an autosomal dominant inherited disorder with oral manifestations in 4–7% of the cases.

Case report: An 11-year-old male with neurofibromatosis I, leukemia and prior hematopoietic stem cells transplantation was referred to our department for oral health evaluation. Intra-orally he had neurofibroma in the palate, severe xerostomia and atrophy of the oral mucosa, gingivitis and gingival recession of teeth #31, #41, multiple carious teeth and crowding. The radiographic examination showed short and slender roots with V shape and

narrow pulp chambers. Treatment of this case except of the carious teeth referred mostly to management of the severe xerostomia and its side effects by applying an intensive preventive program. Saliva substitutes, sipping frequently sugar free liquids, topical fluorides for home and office use in the maximum doses compatible with his age, demineralizing mousse, sealants to all prone surfaces and above all meticulous oral hygiene. The patient was initially reluctant to cooperate in applying this preventive program, however he complied during the 5 years follow up.

Comments: The management of patients with severe xerostomia due to systemic diseases needs the dentist to be patient and persistent and the patient to comply with the suggested preventive program.

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Vitamin D-resistant rickets oral manifestations and treatment concerns

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Introduction: Vitamin D-resistant rickets (VDRR), also known as x-linked familial hypophosphatemia is a form of rickets which is resistant to the usual doses of vitamin D. There are four clinical manifestations of VDRR: Hypophosphatemia only, hypophosphatemia and active rickets, hypophosphatemia in adults with inactive or healed posttraumatic deformities and hypophosphatemia in adults with rickets deformities and active osteomalacia.

The classical dental finding in VDRR patients is spontaneous oral abscesses even in caries-free teeth. Other dental findings include delayed eruption, delayed apical closure, wide apical foramina, obscure or absent lamina dura, abnormal alveolar bone patterns, enlarged pulp chambers and extension of pulp horns into the cusp tips, numerous accessory root canals, wide root canals, and thin enamel.

Case report: Patient male, Caucasian, 9-year-old referred by a general dentist was diagnosed with VDRR. Clinical examination revealed extraorally frontal and occipital bossing, and intraorally delayed eruption of the teeth and draining fistula. Large pulp chambers with pulp horns reaching the DEJ, thin enamel and wide pulp canals were found with radiographic examination.

Comments: The goals of the dental treatment in cases of VDRR are to preserve the dentition and to avoid dental abscesses. These goals are accomplished by the following: Early dental referral after medical diagnosis, education of the medical community by pediatric dentists could be helpful to these patients. Frequent oral examinations and routine care. The placement of occlusal sealants. In case of detecting abscess formation, endodontic treatment (pulpectomy) and full coverage of molars should be considered.

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The role of care in nutrition as a form of child neglect

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Introduction: Child neglect is the failure of providing appropriate care to children, either this care concerns support and supervision or it is refers to medical, dental care and nutrition. In modern times, child nutritional neglect, can lead either to malnourished children especially in the developing countries or to obese children in the developed countries.

Aim: The aim of this study is to demonstrate the importance of nutrition neglect in children and the overall consequences in children's physical and mental health.

Design: A systematic review has been conducted through Medline and hand search. The search was specified in nutrition neglect resulting to obesity.

Results: The current review refers to types of malnutrition, the risk assessment of obesity for children neglected by their parents, and the medical neglect that accrues from the nutritional neglect.

Conclusions: Malnutrition is a phenomenon, registered originally in the developing countries and it is accepted as an act of nutritional neglect. Still, in the 21st century, nutritional neglect that leads to malnutrition occurs, even, in families with loving parents. Obesity of adults is another phenomenon of our century and, is associated with nutritional neglect during childhood. Cases of severe child obesity, emphasize the need to understand when a case of obesity in a child, is a real medical/dental neglect and when it becomes a child protection issue. Pediatricians, dentists, general doctors and nutritionists, should be aware that nutritional neglect may lead to childhood malnutrition or obesity and furthermore to death, if left untreated.

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Midazolam sedation for young children: preliminary case series study

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Background: In very young children, oxygen nitrous oxide inhalation sedation is often not successful, thus general anesthesia could be the alternative. In different countries, studies have shown that midazolam, administered orally or rectally, was a safe and effective method of sedation for young children.

Aim: The purpose was to determine the safety and efficacy of rectal midazolam for conscious sedation, when administered by trained paediatric dentists in a dental hospital setting.

Design: The selection criteria were age between 1 and 5 years, ASA I or II. Exclusion criteria were any conditions that predispose to

airway difficulties and the use of medications interfering with pharmacokinetics of midazolam. All the children were previously examined by the anaesthetist. Informed consent was obtained. The patients received 0.35 mg/kg midazolam. Behavior and sedation variables were assessed at defined time intervals using the modified Venham scale and the Houpt scale. Oxygen saturation was monitored.

Results: Ninety sessions have been performed in 67 patients. Acceptable behavior was observed in 83% children, but treatment was completed in 93% of the sessions. Minor adverse events, such as vomiting, hiccup and hyperexcitability, occurred in 14% of sessions. The acceptance of rectal administration was better in children aged one and two.

Conclusions: Rectal midazolam sedation, performed without the presence of anesthesiologists, was a safe and effective method for punctual dental treatments in very young children, on the condition of an appropriate selection of the patients.

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Prevalence of dental anxiety among middle school students and their caregivers

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Background: The prevalence of dental anxiety has been reported to range from 5 to 20% in various countries. Several studies have demonstrated that dental anxiety in children was significantly associated with parental anxiety and it has been found that women tend to report more dental fear than men and younger people being more dentally fearful than older individuals.

Aim: This study aimed at assessing the prevalence & severity of dental anxiety among middle school students and their caregivers in Jeddah city-Saudi Arabia, and at analyzing the association between caregivers' anxiety and that of their children.

Design: A cross-sectional study was conducted with 518 middle school students aged 11–15 years and their caregivers in the city of Jeddah. The Norman Corah's Dental Anxiety Scale (DAS) was used to measure dental anxiety among the study group.

Results: Dental anxiety was significantly associated with gender & school type ($P = 0.05$ each). Female students demonstrated significantly greater DAS compared to males (37.8 vs 11.4, $P = 0.05$) with more females scoring severe and high DAS scores. Also students in public schools showed more severe anxiety than those in private schools (30.4% compared to 6.8%, $P = 0.05$). There was a positive correlation between DAS in caregivers and their children ($r = 0.34$, $P = 0.001$). Children were mostly anxious about tooth extractions while caregivers were anxious about root canal treatment.

Conclusions: Gender and school type are associated with dental anxiety in middle school children. Caregivers' anxiety is associated with that of their children.

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Parental attitude towards behavior management techniques used in pediatric dentistry in KuwaitA. FARIDOUN¹, D. AL-NAGGAR² & A. HASAN²¹*Paediatric Dentistry Department, Leeds Dental Institute, University of Leeds, Leeds, UK;* ²*Developmental and Preventive Sciences Department, Faculty of Dentistry, Kuwait University, Kuwait***Aim:** The aim of this study was to evaluate the attitude of parents in Kuwait toward different behavior management techniques (BMT) commonly used in pediatric dentistry.**Design:** Hundred and fifty parents participated in this study by answering a questionnaire and were asked to rank 11 behavior management techniques (BMT) according to their preference, from the most acceptable (rank 1) to the least acceptable (rank 11). A verbal explanation of each technique was provided before they filled the questionnaire. Techniques investigated were: *Conscious sedation, Hand-over-mouth, Passive physical restraints, Active physical restraints, Parental presence/absence, Positive reinforcement, Non-verbal communication, Tell-show-do, Voice control, Distraction, and General Anesthesia.***Results:** All parents managed to return the questionnaire. The ranking of the techniques in an order of decreasing acceptance as reported by the parents was: (i) *Tell-show-do*; (ii) *Positive reinforcement*; (iii) *Parental presence/absence*; (iv) *Distraction*; (v) *Non-verbal communication*; (vi) *Voice control*; (vii) *Sedation*; (viii) *Active physical restraints*; (ix) *Passive physical restraints*; (x) *Hand-over-mouth*; (xi) *General anesthesia*. There were no statistically significant associations between the level of acceptance and parent's gender, child's gender, order of the child between his/her siblings, and the presence of medical problems. However, some factors were significantly associated with parental acceptance to certain BMT, such as *tell-show-do* with parent's age ($P = 0.028$), nationality ($P = 0.022$), level of education ($P = 0.026$), residency ($P = 0.044$), occupation of mother ($P = 0.009$), and place of receiving dental treatment ($P = 0.032$).**Conclusions:** Parental attitude toward different BMT varies considerably between parents with a number of factors significantly influencing the parental level of acceptance of certain BMT.

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Evaluation of children senses in tooth caries treatment with bur and air abrasion

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*Riga Stradins University, Riga, Latvia***Background:** There are many modern technologies entered dentistry in past years, changing patient's attitude to visiting a dentist and reducing an anxiety. However in pediatric dentistry the fear of dentist still is the main problem. To decrease an anxiety during a visit, air abrasion technique has been used in treatment of timid children.**Aim:** To select children with increased stress reactions and to evaluate the senses after tooth caries treatment with bur and air abrasion.**Design:** For selecting children with increased stress reactions a questionnaire was created. 150 children at age 8–15 years (74 male and 76 female) participated in the survey. The fear of anesthesia

and visiting a dentist were evaluated. Dental check up was made for 10 selected children with increased stress reactions. Two tooth treatment was performed for each child one with bur and one with air adhesion. The senses during the treatment were evaluated.

Results: In our survey we observed, that 73% (110 children) are afraid of visiting a dentist. For 67% (101 children) anesthesia causes the main stress. Using bur for tooth caries treatment, there was a necessity for a local anesthesia. Caries removal using air abrasion was made without local anesthesia, as sensitivity was very low (four children) or missed (six children). All treated children noted that air abrasion do not cause the fear.**Conclusions:** The air abrasion use in pediatric dentistry would be recommended for children with increased stress reactions.

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Cognitive behavioural therapy or nitrous oxide sedation is more effective in reducing dental anxiety in preschool childrenF. MAZHARI¹, A. SARRAF SHIRAZI¹, J. FANI², F. MOHARRERI³, A. SOLTANIFAR³ & F. KEBRIAE⁴¹*Department of Paediatric Dentistry, Mashhad University of Medical Sciences, Mashhad, Khorasan Razavi, Iran;* ²*Department of Oral & Maxillofacial Surgery, Dental school, Mashhad University of Medical Sciences, Mashhad, Khorasan Razavi, Iran;* ³*Department of Psychiatry, Medical School, Mashhad University of Medical Sciences, Mashhad, Khorasan Razavi, Iran;* ⁴*Dental School, Mashhad University of Medical Sciences, Mashhad, Khorasan Razavi, Iran***Background:** Despite the availability of an array of behavior management techniques, dental anxiety appears to be a widespread problem in children.**Aim:** The aim of this study was to compare the effectiveness of inhalation sedation with Nitrous oxide/Oxygen (N₂O/O₂) and CBT to reduce dental anxiety in preschool children.**Design:** This study was done on 45 preschool children with moderate to severe dental anxiety and at least one mandibular primary molar requiring pulp treatment. The primary anxiety and cooperation levels were determined. Then children were randomly assigned to one of the three groups: Control, N₂O/O₂, CBT. In control group, usual behavior management techniques; in N₂O/O₂ group, Nitrous oxide-Oxygen gases and in CBT group unrelated play, Benson's breathing and positive self-talk and modeling were used. The anxiety and cooperation levels were determined in three periods: injection, rubber dam and application of high-speed handpiece. The anxiety & cooperation differences between the two dental visits were compared within the three groups.**Results:** The results showed significant differences among the three groups. N₂O/O₂ and CBT significantly resulted to lower anxiety ($P = 0.00$) and higher cooperation ($P = 0.00$ in N₂O/O₂ & $P = 0.04$ in CBT) in the second visit compared to control, but there was no significantly difference between CBT and N₂O.**Conclusions:** The two treatment methods tested were both effective in reducing dental anxiety in preschool children. With regard to adverse effects and necessity of equipment and trained personals in N₂O/O₂ method, and more acceptability and applicability of CBT method, CBT appears to be more preferable to N₂O/O₂.

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Wall mural preferences among children

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Background: Wall murals can be used as part of behavioral management in paediatric patient. However, not many studies have been conducted regarding this matter.

Aim: To determine the need and preference of wall mural themes among children in a paediatric dental setting.

Design: Pre-tested questionnaires were distributed to 100 school children ranging from 7 to 16 years about the influence that a wall mural has in their anxiety.

Results: More than 70% of the children thought that wall mural is important. Forty two percent of the children felt that presence of wall mural reduces anticipatory anxiety prior dental treatment while 27% said it makes the waiting area cheerful. Analysis between genders revealed that 53% females felt wall mural reduces anticipatory anxiety of dental treatment compared to 29% of the males. 51% of the males think wall mural makes the waiting area more cheerful compared to 17% of the females. Analysis based on age groups revealed that both the primary (37%) and secondary (43%) school children believe that wall mural generally reduces anxiety of dental treatment. Mural themes that reflect cartoon characters, galaxy and nature were among the favorites by children. Boys appear to prefer themes based on galaxy (43%) than girls who prefer cartoon characters (39%). Primary school children prefer cartoon characters (33%) while secondary school children more keen towards nature (27%) and galaxy themes (27%).

Conclusions: Children generally feel wall mural is necessary and it helps to reduce anticipatory anxiety prior to dental treatment. Mural based on cartoon characters, galaxy and nature were the favorite among children.

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Paediatric dentists' perception of preschoolers' dental pain: an exploratory qualitative study

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Background: Pain perception in preschoolers is a challenge. Although the physiological pathways of pain have been described there are few studies concerning professionals' perception of dental pain in this age group.

Aim: To gain an in-depth understanding of pediatric dentists' perception of dental pain in preschoolers.

Design: Five pediatric dentists participated voluntarily in a focus group to investigate their beliefs and perceptions concerning children's dental pain. The activity was conducted by a moderator with the help of a guide based on two questions: 'How do you perceived pain in children?' and 'What does it mean to identify dental pain in preschoolers?' All answers were audio-taped for later

verbatim transcription. Responses were examined by content analysis, allowing abstractions from transcript codes and categories.

Results: Two categories emerged from data analysis: pain expression and pain meaning. The pain expression category revealed that pediatric dentists can perceive preschoolers' dental pain based on clinical signs or a change in family routine; the pain meaning category showed that they accept that pain recognition is the key point in child treatment and management. 'Dental pain in preschoolers is easily perceived by professionals but is underestimated by family' is a theme which arose when interpreting the research.

Conclusions: The main findings of this study were the importance of dental pain in children's oral health, the ability of pediatric dentists to identify it by 'feel' and the underestimation of dental pain, which was only attributed to parents.

P20-355

Monitoring parents' satisfaction regarding university dental services in a university based department of paediatric dentistry

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Background: Patients' satisfaction is an important tool for assessing quality in dental care, although nowadays, staff and operation of dental offices are also important. In paediatric dentistry, it is difficult to evaluate patients' satisfaction due to the lack of appropriate questionnaires.

Aim: The aim was to evaluate parents' satisfaction with the dental services provided to their children.

Design: The study took place in the Department of Paediatric Dentistry, University of Thessaloniki over a 2-month period. A questionnaire was distributed to Greek-speaking parents whose children received restorative treatment, in order to evaluate their satisfaction regarding the operative room, the communication with the staff and the dental services. There were also four open-ended questions.

Results: Sixty two questionnaires out of 73 were returned fully completed (response rate: 85%). The average level of parental satisfaction regarding the services provided was high. Highly educated parents were less satisfied in almost all fields ($P = 0.008-0.03$). Parents accepted more easily behavior management techniques when they felt that the dentist spent more time with them ($r = 0.496^{**}$, $P = 0.001$) and they were more satisfied with dental care when they were better informed about the treatment plan ($r = 0.920^{**}$, $P < 0.001$). In open-ended questions most parents (58%) stated very satisfied with dentists' politeness and willingness and all of them would recommend the clinic to other patients. 13 out of 62 parents (20%) suggested the decrease of patient fees and waiting time, and the extension of the working hours.

Conclusion: The majority of the parents were satisfied with dental services and dentists' behavior and they suggested ways of improving reception services.

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Pilot study of different factors related to dental anxiety in 4–12-year-old children in LatviaL. KRONINA¹, R. CARE² & M. RASCEVSKA³¹*Department of Paediatric, Institute of Stomatology, Riga Stradins University, Riga, Latvia;* ²*Department of Conservative Dentistry, Riga Stradins University, Riga, Latvia;* ³*Faculty of Pedagogy, Psychology and Arts, Latvian University, Riga, Latvia*

Background: Fearful patients often attend dentists to alleviate the pain, but they do not proceed with the routine treatment. Visiting the paediatric dentists often postponed due to inappropriate behaviour of these children. Thus, fearful patients might have higher DMFT index. Dental fear is often related to parental dental anxiety and different psychosocial factors.

Aim: Of the study is to evaluate the relationship between children's dental anxiety, dental caries, dental behaviour and parental dental anxiety.

Design: Twenty eight children (mean age 8.8 years, SD = 2.37) and their parents took part in pilot study. Parents evaluated their own dental anxiety (MDAS), and their children's anxiety (CFSS-DS). Other psychosocial factors were established by an originally created questionnaire (before or during visit). Dental status was fixed and DMFT was calculated. Dental behaviour was evaluated by a dentist (Frankl scale).

Results: There was statistically significant negative correlation between children's dental anxiety and their behaviour ($r = -0.69$, $P < 0.05$). The correlation between children's dental anxiety and DMFT was $r = -0.02$, ($P > 0.05$), but between children's and their parents' dental anxiety it was $r = 0.008$, ($P > 0.05$).

Conclusions: The pilot study confirms that there is statistically significant correlation between children's dental anxiety and their behaviour during visit, which means, that the higher is their anxiety, the worse is their behaviour. No statistically significant correlation was found between children's dental anxiety and DMFT or children's and their parents' dental anxiety in this stage of study. Correlation between children's dental anxiety and other factors must be examined.

P20-357

Dental student and patient predictors of patient satisfaction with dental appointmentsD. LAZARIDOU¹, D. TSIANTOU¹, T. COOLIDGE², A. GATIDOU¹, K. ARAPOSTATHIS¹ & N. KOTSANOS¹¹*Department of Paediatric Dentistry, Aristotle University of Thessaloniki, Greece;* ²*Department of Dental Public Health Sciences, University of Washington, Seattle, Washington, USA*

Background: Patient satisfaction with dental appointments is desired by both dentists and patients. Researchers are concerned with identifying factors which are related to patient satisfaction.

Aim: The aim of the study was to evaluate the impact of dental student and patient variables on patients' satisfaction with dental appointments.

Design: Two hundred and sixty nine patients and the dental students treating them at Aristotle University of Thessaloniki, Greece completed questionnaires. Patients completed the Dental Visit Satisfaction Scale (DVSS), as well as the Patient Assessment Questionnaire (PAQ) and Patients Communication Style Scale (PCSS), which measure patients' ratings of students' communication/interpersonal skills and their preferences to actively participate

in treatment planning, respectively. Students completed the Toronto Composite Empathy Scale (TCES) and the Attitudes Towards Patient Education Scale (ATPES), which measure empathy and students' preference for patients who are more educated about their dental condition, respectively.

Results: There were no significant relationships between patients' satisfaction and either student variable (TCES, ATPES). Male patients were more satisfied when treated by female students ($P = 0.037$). More satisfied patients rated the students' communication/interpersonal skills as significantly higher (PAQ; $P < 0.001$); these relationships were significant for patients and students of both genders (P 's < 0.05). Female patients who were more satisfied preferred to actively participate in treatment planning, regardless of students' gender (PCCS; P 's < 0.05). There was no relationship between PCCS and satisfaction for male patients.

Conclusions: Patient ratings appear to be more important than dentists' ratings in predicting patient satisfaction. Both dentist and patient gender may be important determinants of patients' satisfaction.

P20-358

A report looking at anxiety profile of parents and children who received dental treatment under oral sedation at the paediatric department at Kings college hospital, sedation unitL. L. MATHARU¹, J. PATEL¹ & S. PATEL²¹*Paediatric Department, Kings College London Hospital, London, UK;* ²*University of Greenwich, London, UK*

Background: Dental fear and anxiety are common in children resulting in avoidance of treatment and disruptive behaviour. Many variables contribute to this fear, including child's age, gender, general fears and parents' anxiety.

Aim: The aim was to determine parent's perception of dental and general fears profile of children referred to the Paediatric Department at King's College Hospital having dental treatment under oral midazolam for conscious sedation, to assess dental fear of the accompanying parent and correlate with overall behaviour during treatment.

Methods: Parents were given: Children's Fear Survey Schedule dental subscale (CFSS-DS), short form of Children's Fear Survey Schedule (CFSS-SF), and Corah's Scale (DAS) to complete. During the clinical procedure child behaviour was rated using the Houtp Scale. Other data collected included the child's age and gender.

Results: One hundred and fifty four parents scored high CFSS-DS, 206 high CFSS-SF and 129 high DAS. A significant statistical association was found between high scored CFSS-DS and DAS ($P = 0.010$), but not for CFSS-SF. A statistical correlation was found between the CFSS-SF group when compared to CFSS-DS ($P = 0.010$) and DAS scores ($P = 0.011$). No statistical significant differences were found for age, gender and overall behaviour during dental treatment for the high CFSS-DS, CFSS-SF and DAS groups.

Conclusion: Approximately one third of the children who were perceived as having dental and general fears had a significant number of parents with dental fear. Parental anxiety and perception of their child's dental and general fear cannot predict the behaviour during treatment under oral sedation.

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Audit of the impact of dental trauma first aid (DTFA) training on the knowledge of the management of tooth avulsion by non dental health personnel

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Background/Aims: The prognosis of avulsion type injuries can be majorly influenced by initiating correct and prompt treatment within the first 30 min of the event. The aim of this audit was to ascertain the impact of dental trauma first aid training on the knowledge and subsequent management of tooth avulsion by non-dental health personnel. Casualty nursing staff and local rugby coaches were chosen as being front-line personnel who would have an increased possibility of contributing to such an event.

Design: A cross sectional audit study using self-administered questionnaires before and after receiving a power point presentation on dental trauma first aid was given to the two groups: a total of 113 casualty nursing staff representative of 52% of total casualty nursing staff and to 24 rugby coaches/first aiders representative of 39.6% of the total number of Borders rugby union clubs.

Results: The audit focused on four main responses known to have an increased impact on the success of replantation and knowledge pre-training demonstrated poor exposure to any dental trauma training. All responses showed improvements in both test groups after training with main responses improving to between 80% and 100% of respondents giving the correct answer.

Conclusion: The audit demonstrates implications for the successful training of both sports coaches and casualty nursing staff.

P21-360

Inhibitory effect of *Lactobacillus reuteri* on periodontopathic and cariogenic bacteria

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Background: The interaction between *Lactobacillus reuteri*, a probiotic bacterium, and oral pathogenic bacteria have not been studied adequately.

Aim: This study examined the effects of *L. reuteri* on the proliferation of periodontopathic bacteria including *Aggregatibacter actinomycetemcomitans*, *Fusobacterium nucleatum*, *Porphyromonas gingivalis* and *Tannerella forsythia*, and on the formation of *Streptococcus mutans* biofilms.

Design: Human-derived *L. reuteri* strains (KCTC 3594 and KCTC 3678) and rat-derived *L. reuteri* KCTC 3679 were used. Their effect on the growth inhibition of Periodontopathic bacteria and the formation of *S. mutans* biofilm, cariogenic bacteria were evaluated.

Results: All strains exhibited significant inhibitory effects on the growth of periodontopathic bacteria and the formation of *S. mutans* biofilms. These antibacterial activities of *L. reuteri* were attributed to the production of organic acids, hydrogen peroxide and bacteriocin-like compound. Reuterin, an antimicrobial factor, was produced only by *L. reuteri* KCTC 3594. In addition, *L. reuteri* inhibited the production of methyl mercaptan by *F. nucleatum* and *P. gingivalis*.

Conclusion: *Lactobacillus reuteri* exhibited significant inhibitory effects on the growth of periodontopathic bacteria and the formation of *S. mutans* biofilms. Overall, these results suggest that *L. reuteri* may be useful as a probiotic agent for improving oral health.

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Green tea extract as new storage medium for avulsed tooth

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Background: Green Tea Extract (GTE) has been reported to have remarkable anti-inflammatory, antioxidant, anti-carcinogenic effects and to prolong allograft survivals.

Aim: The purpose of the present study is to investigate, *in vitro*, the efficacy of GTE as storage medium for avulsed teeth. We estimated the possibility of GTE for storage medium by maintaining the viability of Human Periodontal Ligament (PDL) cells.

Design: Human PDL cells were cultured and stored in the following media: (i) HBSS, (ii) Tap water, (iii) Milk, (iv) GTE, and (v) Commercial green tea. Then in the next 1, 3, 6, 12, and 24 h from the point of this storage, each well was subsequently examined under the optical microscope and cell viability was analyzed by using NucleoCounter® and MTS assay. The data were statistically analyzed following SPSS procedure and ANOVA test and each test complemented by a post-analysis using the Duncan's method with 0.05 significant levels.

Results: The result indicates that there was no difference in cell viability between GTE and HBSS media while GTE showed higher cell viability than other media ($P < 0.05$).

Conclusion: Our study shows that the efficacy of the GTE in maintaining the viability of human PDL cell is similar to that of the HBSS and more than that of Milk. Therefore, we conclude that GTE could be a suitable, alternative storage medium for avulsed teeth.

P21-362

Application of protection-motivation theory to decrease caries incremental rate in young children (age 9–18 months)

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Background: Tooth brushing with fluoride dentifrice can reduce caries prevalence. However, for infants (9–18 months), it is not widely practiced, since it requires skill and motivation of parents. To create awareness and cooperation from parents, Protection-Motivation Theory (PMT), emphasizing cognitive processes mediating behavioral change, was used to achieve this goal.

Aim: Understanding and motivation of parents is key to success in decreasing caries incremental rate in children. This study was designed to compare the caries incremental rate of PMT group with control group (traditional oral-health education program)

Design: Group of 102 children (age 9–14.5 months) from Nakhonratchasima province and their parents were randomly assigned to either PMT or control groups. Those in 'PMT' group received PMT oral-health education program, and two four monthly empowering sessions. The control group received demonstrations of tooth brushing technique. Baseline and 1 year caries examination (double-blind technique) was taken for both groups.

Results: Protection-Motivation Theory group showed a lower caries incremental rate than control (two sample *t*-test, $P < 0.05$). In terms of motivation and awareness measurement, the best predictors of tooth brushing behavior were perceived self-efficacy and perceived severity (paired *t*-test, $P < 0.05$).

Conclusions: Protection-Motivation Theory can encourage the cognitive process and motivate oral-health care behaviors of parents leading to their children's decreasing caries incremental rate.

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Management and 3-year follow-up of traumatically root-fractured primary incisors: a case report

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Introduction: Primary tooth trauma mostly affects the maxillary incisors of children 1–3 years of age, with worldwide prevalence ranging from 11–30%. However, a traumatic episode involving root fractures of primary incisors is a rare occurrence.

Case report: A 3 year old girl was brought to our department complaining about pain and abnormal mobility on her upper incisors following an accidental fall 6 h earlier. Intra-oral examination revealed increased mobility for the maxillary primary central incisors with laceration and bleeding in the gingiva. Radiographic examination revealed a horizontal root fracture in the middle third of the left incisor and in the apical third of the right. Under local anesthesia, both incisors were repositioned, and

splinting was performed. One month after splinting, the swelling of gingiva subsided, but the apical fractured segments were in the process of rapid absorption. By 4 months, the absorption was almost completed, while the tooth mobility was back into physiological limits. During the 36-month recall, the patient had no discomfort, no clinical adverse signs or radiographic signs of developing pulp necrosis were noted. Instead, continuous root absorption was observed for the primary incisors and replacement by the succeeding permanent ones with no obvious developmental abnormalities occurred.

Comments: In this case, two traumatically root-fractured primary incisors were well-preserved with normal replacement. Thus, besides the widely performed 'tooth extraction' method, there is a need for the consideration of conservative measures on traumatically root-fractured primary incisors.

P21-364

Low level laser therapy effects on the proliferation of primary teeth dental pulp stem cellsC. MOURA-NETTO¹, L. S. FERREIRA¹, F. S. SILVA², C. M. C. MARANDUBA³ & M. M. MARQUES¹¹*Department of Endodontics, Dental School, University of São Paulo, São Paulo, Brazil;* ²*Department of Biotechnology, Biomedical Sciences Institute, University of São Paulo, São Paulo, Brazil;*³*Department of Biology, Biological Sciences Institute, Federal University of Juiz de Fora, Minas Gerais, Brazil*

Background: Dental trauma in immature permanent teeth can damage pulp vascularization that leads to necrosis and cessation of apexogenesis. Studies on tissue engineering using primary teeth dental pulp stem cells (DPSC) have been showing promising results. Similarly low level laser therapy (LLLT) could improve proliferation and differentiation of these cells.

Aim: To evaluate the influence of different energy densities (3 J/cm⁻² and 5 J/cm⁻²) of LLLT on the growth of DPSC cultured under nutrition deficiency.

Design: Dental pulp stem cells (8th passage) were seeded in 96-well culture plates (10³ cells/well) and allowed to attach in culture medium supplemented with 15% Hyclone defined fetal bovine serum (FBS) for 12 h. To promote nutrition deficiency, the FBS percentage was reduced by 5%. Cells were assigned in 4 groups: G1-15% FBS (control), G2-5% FBS, G3-5% FBS + LLLT 3 J/cm⁻², G4-5% FBS + LLLT 5 J/cm⁻². For LLLT groups, two laser irradiations with 6 h-interval were performed using a diode laser (660 nm-InGaAlP, 0.028 cm², 10 mW). Cell viability was assessed by MTT assay immediately after the second laser irradiation (0 h) and 24, 48 and 72 h after.

Results: Low level laser therapy 5 J/cm⁻² group showed similar cell growth rate than control group at 48 h and 72 h ($P > 0.05$) and presented a significant higher cell growth rate when compared to 5% FBS group ($P < 0.01$).

Conclusion: It can be concluded that LLLT with 5 J/cm⁻² can enhance the growth of DPSC even in nutrition deficiency having similar growth rate to ideal nutrition condition. Therefore, LLLT could be a valuable adjunct treatment on tissue engineering using stem cells obtained from primary teeth dental pulp.

P21-365

Multiple dental traumas in a 9-year-old patient, 14 months follow up

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Introduction: Trauma to multiple teeth present a challenge for dentists, as each tooth has to be treated on an individual basis depending on the pulp diagnosis and tissue lost.

Case report: A 9-year-old girl presented to the clinic in December 2009 having suffered a dental trauma to the upper central incisors and right lower incisor 24 h earlier. Clinical and radiographic diagnosis was: 11: Enamel-dentin-pulp fracture, 21: oblique root fracture in the middle third with a palatal-buccal direction, 41: enamel-dentine fracture, and 42: enamel fracture. Initial treatment consisted of: 11: partial pulpotomy using calcium hydroxide and glass ionomer, 21: stabilization splinting for 30 days, 4.1: Glass ionomer and composite restoration, 4.2: composite restoration. After 2 weeks restoration on tooth 11 was infiltrated; there was a buccal fistula and the X-ray revealed increased periapical space. Root canal treatment was performed. At the 4 months follow up appointment a definitive restoration on tooth 11 was performed. Teeth 11 and 42 presented no signs and symptoms. At the 14 months follow up all teeth were symptoms free. Root canal of tooth 21 was narrower and the borders of the fragments looked rounded, with good signs of healing.

Comments: Each traumatized teeth requires a specific treatment and follow up schedule. A case of multiple different types of fractures in a 9 year old patient are presented highlighting the importance of close follow up during dentition change, as the pulp is still developing and there are occlusal changes happening.

P21-366

The role of enamel matrix derivatives, rhTGF- β , rhTGF- α , rhIGF-I and rhBMP-7 in periodontal ligament cells differentiation. Implications for replantation of avulsed teeth

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Background: Replantation of avulsed teeth is often employed after trauma with unpredictable, however, success. Periodontal ligament cells (PDLC) seem to play a critical role in preventing future root resorption and ankylosis. Clinical studies reveal that enamel matrix derivatives (EMD) promote the regeneration of the periodontal ligament apparatus and thus have been used for replantation. *In vitro* studies, also, demonstrate that PDLC may exhibit mineralized tissue-forming phenotypes and thus, enhance new cementum and bone formation. This could in turn be important for the survival of replanted teeth.

Aim: To evaluate whether EMD and several growth factors, including bone morphogenetic proteins (BMPs) may stimulate PDLC to differentiate to mineralized tissue-forming cells.

Design: Harvested human PDLC were cultured and challenged with 25 ng/mL rhBMP-7, rhTGF- β , rhIGF-I and rhFGF-I alone or in combination with 100 ng/mL EMD. Cell differentiation was evaluated after 3 and 5 days by measuring alkaline phosphatase (ALPase) activity and osteocalcin (OC) from the supernatant. Statistical analysis was performed using student's *t*-test and ANOVA with Bonferroni correction.

Results: Compared to the control, EMD and all factors when used separately increased ALPase activity both at 3 and 5 days. Enamel matrix derivatives, rhBMP-7 and rhTGF- β had similar and the strongest effect. Similar results occurred when EMD was combined with each factor separately both at 3 and 5 days. OC levels remained low in all cases.

Conclusions: Enamel matrix derivatives, rhTGF- β , rhFGF-I, rhIGF-I and rhBMP-7 alone or in combination induce PDLC to acquire a mineralized tissue-forming phenotype. This may inhibit root resorption and enhance the survival of replanted teeth.

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P22-367

Oral health knowledge and behavior in a group of Iranian students: a cross-sectional study

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Background: The establishment efficient self-preventing methods of oral diseases, assessment of dental health behavior and knowledge in various social classes play a crucial role.

Aim: The main purpose of this study is the evaluation of oral health knowledge and behavior in a group of Iranian pre-university students.

Design: In this analytical-cross sectional study, five hundred ninety one pre-university students from different regions of Mashhad, Iran were randomly selected and completed a questionnaire consisted of two parts with questions about dental health behavior and knowledge. Scores were calculated and statistical analyses were performed to determine the correlation between dental health behavior and knowledge. Data was analyzed with *T*- student, ANOVA and Pearson Correlation.

Results: The average score of dental health knowledge was significantly lower than dental health behavior (2.95 ± 0.02 vs 3.31 ± 0.05 , $P < 0.001$). This difference was observed in gender, birth location and students major. In addition experimental sciences students had better oral health behavior comparison to others.

Conclusions: Iranian pre-university students' dental health behavior was not optimal while their dental health knowledge was in a lower level than behavior. Using different educational methods, considering increase of students' knowledge and health attitude, contextualizing the health behaviors with emphasis on risk groups such as boys, mathematics sciences students and students with low level of parental education, could have significant effect on promotion of oral health in society.

P22-368

Agreement between observed children's tooth brushing habits and those reported by mothers

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Background: Mother is usually the most capable person to report their children oral health behavior, such as tooth brushing habits.

Aim: The aim of this study was to compare observed tooth brushing habits of young children and those reported by mothers.

Design: Two hundred six mothers and their children (9–48 months-old) from Montes Claros, Brazil, took part in this cross-sectional study. Mothers answered a self-administered questionnaire on their child's tooth brushing habits. Each mother/child pair at the daycare centers was asked to perform the tooth brushing as they usually do at home. One trained examiner observed and documented the tooth brushing habit. Observed tooth brushing and that reported by mothers were compared for overall agreement using Cohen's Kappa coefficient, chi-square and Fisher's exact tests.

Results: When observed by the examiner, the prevalence of children using dentifrice (54.9%), dentifrice dispersed on all bristles (35.1%) and children that spit the dentifrice out (76.6%) was more pronounced than the prevalence based on maternal report (49.5%, 11.9%, 38.9%, respectively; $P < 0.05$). There were statistically differences between the observed tooth brushing habits and those reported by the mothers ($P < 0.001$). Cohen's Kappa value ranged from poor to moderate (0–0.49).

Conclusions: There was low agreement between observed brushing and the mothers' reports. Moreover, the prevalence of habits was different between the methods employed, suggesting that children's tooth brushing habits, as reported by mothers and the observation data, should be considered with caution in epidemiological surveys.

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P22-369

Status of early childhood caries of 3-year-old children in Shanghai China

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Aim: To investigate the status of early childhood caries (ECC) of 3 year old children in Shanghai in order to achieve better prevention and control of ECC.

Method: A sample of 600, 3-year-old children was drawn for oral health check up from the urban and rural districts in Shanghai with a multistage, stratified, equal sized, simple random sampling method criteria.

Results: The prevalence of ECC was 49.00% with a mean dft of 2.17 ± 3.18 , and dfs of 2.99 ± 5.30 . A higher prevalence of ECC was found in rural (55.6%) compared to urban districts (42.33%), while the mean dft was similar in both areas (data). The total filling rate was 3.92%. Significant difference was found between filling rate in rural districts (2.74%) and urban districts (5.44%). The teeth mostly affected were upper middle incisor and lower molars.

Conclusions: The prevalence of ECC in Shanghai was severe. This finding reinforces the importance of early intervention in reducing ECC in younger children.

P22-370

Investigation of Dental Caries among 12-year-old children in Shanghai, China

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Aim: The aim of this study is to register the caries prevalence of permanent teeth among 12-year-old children in Shanghai, and provide foundation for the prevention of dental caries.

Design: According to the basic methods of oral caries diagnostic criteria of WHO code, oral status of 2519 children aged 12 was examined. They were inhabitants of 19 districts of Shanghai.

Results: The prevalence of dental caries was 36.64%. The mean DMFT of 2519 subjects was 0.61. A higher prevalence of dental caries was found in female compare to male. The mean *t* caries index of children 12-year-old children in Shanghai was 1.77. Filling rate of dental caries was 24.58% and the rate of pit and fissure sealant was 0.52%.

Conclusion: The dental caries of children among 12-year-old in Shanghai was polarized distribution. The first molars had the highest caries prevalence. It should take step to strengthen health care for high-risk population, susceptible teeth and to prevent dental caries.

P22-371

Prevalence of dental caries among Shanghai Children in 2010 compared to 1983

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Aim: The aim is to compare the status of dental caries in 5 and 12 year-old children in Shanghai, China between 2010 and 1983 in order to provide information for evaluating oral health care programs and making relevant policies.

Design: A sample of 950 5-year-old and 950 12-year-old children in Shanghai were drawn for oral health examination with multistage, stratified sample random sampling method.

Results: In 5 years old, the prevalence of dental caries was 64.89% and the mean dmft was 4.10 in 2010, which decreased by 26.39% ($P < 0.01$), while the mean dmft was 1.18 in 1983. At the age of 12 the prevalence of dental caries was 34.64% and DMFT was 0.64, which decreased by 17.69% ($P < 0.01$), while the mean dmft was 0.53 in 1983.

Conclusions: The prevalence of dental caries and dmft/DMFT among children decreased obviously in Shanghai. The oral health status of children in Shanghai improved significantly. Possible factors as follows: (i) Special teams provide services about oral health education, oral health promotion, periodic examination and early filling in all schools in Shanghai. (ii) 60–70% of children have used the fluoride toothpaste since 1994. (iii) Fluoride concentration of drinking water in Shanghai has been increased from 0.33 ppm in

1983 to 0.63 ppm in 2010. We must strengthen the oral health programs, and take preventive and care measure for targeted high-risk group in future.

P22-372

The effect of the parental education level and antibiotics administration in early childhood on the oral health of 13 to 15-year-old adolescents in Brno

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Background: A considerable body of evidence has shown that the parental education level as well as health status in early childhood play a significant role in child dental caries. A multicentric European Longitudinal Study of Pregnancy and Childhood (ELSPAC) conducted also in Brno collected a great amount of data from clinical and socio-economic areas related to children's general health.

Aim: To assess the relationship between caries experience of 13-to 15-yr-olds and the education level of their parents/step-parents; and the relationship between enamel opacity prevalence and antibiotics (ATB) administration in early childhood in a retrospective case-series.

Design: Randomly selected children from an ELSPAC cohort in Brno ($n = 780$) were orally examined and their dental status [D₃MFT (WHO 1997)] and enamel opacities (Dean's fluorosis index) were recorded. Data on parental education level and ATB administration were retrieved from the ELSPAC database. Correlations between DMFT *versus* parental education level, ATB administration during the following periods: birth–8 months, 8–18 month and 18–36 months *versus* enamel opacities and D₃MFT were calculated in SPSS.10[®] (Base, Regression) tool using a multilevel regression model.

Results: Mothers'/stepmothers' (but not fathers'/stepfathers') education level significantly negatively correlated with D₃MFT scores of children. The history of ATB administration was not significantly correlated with the prevalence and severity of enamel opacities or caries experience.

Conclusions: The study confirmed a significant correlation of the education level of mothers/stepmothers and caries experience in children, while the correlation of ATB administration with enamel opacities and caries experience was not significant.

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P22-373

Prevalence of dental erosion in Istanbulian Greek minority school children

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*Department of Paediatric Dentistry, Dental School, Yeditepe University, Istanbul, Turkey***Aim:** The aim of this study was to evaluate the prevalence and aetiology of dental erosion in Istanbulian Greek minority school children.**Design:** The present study was initiated in four Istanbulian Greek minority elementary schools in Istanbul where a total of 83 children (46 girls, 37 boys) between ages 7 and 14 years old were examined. Children were categorised into 7–11 and 12–14 age groups. Data were obtained by clinical examination, questionnaire and standardized data records. All tooth surfaces were examined, dental erosion was recorded per tooth and was classified according to classification of Lussi et al.**Result:** In 7–11 years old group, 47.40% ($n:18$) of the children exhibited dental erosion, while in 12–14 years old group, 52.60% ($n:20$) of the children exhibited dental erosion. There were no statistical differences between age, gender groups and findings of dental erosion ($P > 0.05$). However prevalence of dental erosion in 12–14 years old is two-folds more than in 7–11 years old children. In general, unusual drinking pattern of slow swallowing of beverages, significantly affected dental erosion ($P = 0.03$)**Conclusion:** Multiple regression analysis revealed no relationship between dental erosion and related erosive sources such as medical conditions, brushing habits, swimming, consumption of acidic fruit juices and beverages ($P > 0.05$).

P22-374

Prevalence of dental caries in children of primary school

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*Department of Paediatric Dentistry, Moscow State University of Medicine and Dentistry, Moscow, Russia***Background:** Dental caries is the most serious disease in children. It is necessary to know the caries prevalence and experience of the children for planning preventive and therapeutic measures.**Aim:** The aim was to carry out epidemiological examination of children in Moscow primary schools to visualize prevalence and intensity of dental caries.**Design:** Two hundred and three children (pupils of Moscow schools) at the age from six to nine were examined according to the criteria of WHO.**Results:** Oral hygiene level was satisfactory (OHI-S = 1.15). Caries prevalence in permanent teeth was 63.83%, caries intensity equaled 1.63 at the age from six to nine. Decayed teeth prevailed in the structure of DMF-index ($D = 1.36$, $M = 0$, $F = 0.27$) and all of them were first permanent molars. It's important to note that carious cavities were localized mostly on occlusal surfaces (99%). Fissure sealants were revealed in 13 teeth, this indicates insufficient measures of prevention of caries on pit and fissures.**Conclusion:** High level of caries prevalence was revealed in children of primary schools in Moscow. The higher prevalence of caries was found on occlusal surfaces of first permanent molars. Thus widespread application of prophylactic measures for prevention of fissure caries is recommended. All initial carious lesions must be treated including invasive sealing and preventive resin restorations.

P22-375

State value of oral hygiene and periodontal tissues in children of Moscow

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*Department of Paediatric Dentistry, Moscow State University of Medicine and Dentistry, Moscow, Russia***Background:** Epidemiologic data in most countries, show that pathological changes of periodontal tissues in children are the second prevalent oral disease, after caries.**Aim:** To evaluate oral hygiene status and to investigate prevalence and intensity of periodontal disease in children of Moscow at the age of 6, 9, 12, 15 years.**Methods:** The Oral hygiene index (OHI-S) and CPI were evaluated for children 6–15 years, in Moscow, Russia.**Results:** OHI-S was 2.51 ± 0.53 for 6 years, 2.90 ± 0.61 for 9 years, 2.02 ± 0.53 for 12 years and 1.77 ± 0.39 for 15 years. Then isogonic growth of this figure registered with the increase of age. The prevalence of periodontal disease was 22.34% for 6 years, 27.08% for 9 years, 37.78% for 12 years and 57.69% for 15 years children and equaled. Consequently, the mean values (SD) of the CPI, for the above age groups were 0.11 (0.02), 0.41 (0.12), 0.71 (0.18) and 1.02 (0.26).**Conclusion:** Realized analysis showed unsatisfactory level of oral hygiene state in all examined groups of children. There was a tendency for increase of prevalence and severity of periodontal disease with age. Preventive measures, including improvement of oral hygiene skills are necessary for this population.

P22-376

Reasons for extractions of primary and permanent teeth in a group of 3–13 year-old children in IstanbulE. SUNGURTEKIN¹, G. CIRALI¹, D. OZDEMIR-OZENEN¹, H. ISSEVER² & N. SANDALLI¹¹*Department of Paediatric Dentistry, Faculty of Dentistry, Yeditepe University, Istanbul, Turkey;* ²*Department of Public Health, Istanbul Medical School, Istanbul University, Istanbul, Turkey***Background:** Oral health care and preventive measures have been gradually improved during the last decades. Despite these, caries is still prevalent among children and tooth extractions are still required.**Aim:** The aim of the present study is to evaluate the main reasons for the extraction of primary and permanent teeth and determine the treatment types prior to extractions in a group of 3–13 year-old children in Istanbul.**Design:** The dental records of 1011 children who received dental treatment at the Paediatric Dentistry Clinic were analyzed retrospectively. The main reasons for extractions and any dental treatments prior to extraction were recorded. Demographic data including age and gender were also collected.**Results:** From the study population 1245 extracted teeth in total, were analyzed, from 471 children aged between 3 and 13 years. Among these, first primary molars were the most commonly extracted tooth (43.69%). This was followed by second primary molars (33.25%), central primary incisor (7.46%), lateral primary incisor (6.18%), primary canines (5.78%) and first permanent molars (3.61%). Caries was found as the most common reason for extraction (85.38%). Only 26 children (5.5%) had received dental treatment prior to extractions.**Conclusion:** Results of this retrospective study indicated that caries is still the most common reason for extractions of primary and permanent teeth and many children do not have the opportunity to receive dental treatment. Further efforts should be given in order to conduct public health education programs and administer preventive dental care to children at high caries risk.

P22-377

Prevalance and characteristics of ectopic eruption of the first permanent molars

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Background: Ectopic eruption of the first permanent molars show a variable prevalence and characteristics in the populations.

Aim: The purpose of this study was to assess the prevalence and characteristics of the ectopic eruption of the first permanent molars in a sample of Turkish children.

Design: A retrospective study was done using radiographs of 2170 children (1021 girls, 1149 boys), 6–9 years old (mean age, 7.27 ± 1.72) patients of the Department of Paediatric Dentistry of Istanbul University, Istanbul. All radiographs were analyzed for the presence of ectopic eruption of first permanent molars by two examiners. The distribution, pattern, unilateral/bilateral, pathologic resorption of the second maxillary primary molar, aetiological factors, additional dental anomalies were assessed. The baseline data was statistically analyzed by chi-square test (NCSS 2007&PASS 2008).

Results: The prevalence of ectopic eruption of the first permanent molars in the subjects was 0.9% ($n:19$) with no significant differences ($P > 0.05$) in gender. Ectopic eruption was seen more often in the maxilla ($P < 0.05$) and in the right maxillary first permanent molars ($P < 0.05$). Prevalence of bilateral and unilateral ectopic eruption were determined as 52.6% and 47.4%, respectively ($P > 0.05$). The root resorption on the second primary molars was pronounced ($P < 0.05$); increased mesial angulation of the erupting first permanent molars was observed as the main aetiological factor. In four cases, infraocclusion of deciduous molars was noted as an additional dental anomaly.

Conclusions: Data of the study has revealed that early diagnosis and management of ectopic first permanent molars are important in preventing premature loss of second deciduous molars and malocclusions.

P22-378

Cross cultural adaptation of pediatric oral health related quality of life measure (PQOL) in Turkish 2–7 year old population

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Background: The oral health related quality of life measures for pre-school children are in need to assess the impacts of dental health among pre-school age groups.

Aim: To translate and cross culturally adapt the pediatric oral health related quality of life among 2–7 year old Turkish children population.

Design: The PQOL version for 2–7 year old children which are the parent reports on children went through the following process; translation into Turkish, back translations, committee reviews of back translations and bilingual expert committee for reconciliation

of the Turkish PQOL versions. Afterwards the surveys were conducted to parents of 40 children at the age interval of 2–7 who were patients of the Pediatric Dentistry Clinics of Çukurova University Dentistry Faculty. The survey was constituted from a part for dental health's impact on children and another part for children's dental health's impact on parents. Test retest reliability was measured by computing Pearson correlation coefficients. The Cronbach alfa coefficient was calculated to assess the degree of internal consistency and homogeneity between the items.

Results: All items in English version of PQOL were reported relevant in relation to Turkish children's dental and oral health. Conceptually, the back translations were not much different from the original versions, but changes of terms and wording made in process. Test retest (2 weeks) correlations of 0.96 were observed in Çukurova University's patient's parents population.

Conclusion: Turkish version of the PQOL is conceptually equal to the English version and is a reliable measure for using among Turkish pre-school children.

P22-379

Sociodemographic factors, food and drink consumption, BMI index and dental caries in 5–15-year-old children in Istanbul, Turkey

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Background: Dental caries was previously associated with socio-demographic factors, dietary habits and body mass index (BMI) of children.

Aim: The aim of this study was to evaluate the association between socio demographic factors, type of food and drink consumption during snacking and before sleeping, BMI and dental caries in a group of 5–15 year old children.

Design: The study population was 200 children 5–15 years old who presented to Yeditepe University Faculty of Dentistry, Department of Pediatric Dentistry for dental treatment. After collection of socio demographic data, dft, dfs, DMFT, DMFS indices were calculated and recorded for every patient after a comprehensive oral examination. A three day form was used for diet analysis; height and weight were also recorded in order to determine the BMI values.

Results: The mean age of children was calculated as 8.78 ± 2.47 . The mean and standard deviation values were determined as DMFT 2.79 ± 2.74 , DMFS 3.78 ± 4.35 , dft 5.38 ± 4.23 and dfs 10.07 ± 9.15 for the entire group of children. Fathers' education significantly affected the DMFT, DMFS, dft values which were found significantly higher in those children with fathers with low level of education ($P = 0.012$, $P = 0.049$, $P = 0.003$). While consumption of cola, potato chips and biscuits significantly increased dental caries ($P < 0.05$), dental caries values were significantly low in children eating fruits. BMI was positively related to DMFT, DMFS and negatively related to dft values ($P = 0.0001$).

Conclusion: Fathers' low education, acid and sugar intake during snacking and BMI were found to be associated to dental caries in this group of children.

P22-380

Family parameters associated with adolescent's dental health-a preliminary report

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Background: Family Affluence Scale (FAS) is a measure of family wealth. Family Affluence Scale has been developed by WHO as an alternative measure to determine socio-economic inequalities in health and recently has introduced in Dentistry.

Aim: To examine the relation between FAS or mother's education level and caries experience or dental trauma from an urban area of Greece.

Design: A random sample of 100 adolescents (13–14 year old) attending schools in two urban districts was interviewed and examined for caries by one dentist, applying ICDAS criteria to calculate DMF scores. Information about family's wealth was collected by submitting self administered questionnaires to the mothers. The correlation between the dependent variables (DMF and dental injury) and independent ones (FAS and mothers education) were analyzed by Pearson correlation test ($\alpha = 0.05$).

Results: The mean \pm SD values for DMFT and DMFS were 2.06 ± 2.48 and 3.19 ± 4.18 , respectively. Caries free adolescents were 36%. The DMFT was inversely correlated to FAS score ($r = -0.202$, $P = 0.046$), as adolescents with FAS < 18 score had DMFT = 3.1 (± 2.99) with FAS 19–26 score had DMFT = 1.95 (± 2.36) and with FAS > 27 score had DMFT = 1.65 (± 2.21). The highest DMFT values were found among adolescents whom mothers had 12 years of education (2.81 ± 0.48). Moreover, mother's education level showed a small but statistically significant inverse correlation with adolescent's experience of traumatic dental injury of at least one permanent incisor ($r = -0.228$, $P = 0.027$).

Conclusions: Adolescent's dental health is significantly related to family socio-economic conditions. The more the family is affluent and the mother is educated the less the children experiencing caries and dental injuries.

P22-381

Utilization of dental services and oral-hygiene practice at early children's years

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Background: According to the American Academy of Pediatric Dentistry, 'First visit by the first birthday', the best time for the first dental check up is by age one, because the first signs of Early Childhood Caries are seen in this period. As important as this, is to start early and maintain a good oral-hygiene during infancy.

Aim: The aim of this study is to reveal the practice of dental visiting and oral-hygiene habits in young children.

Design: A randomized sample of two hundred and sixteen parents of children who attending kindergartens in municipality Banjaluka, B&H, completed questioner, in order to assess their behavior and

knowledge toward children's utilization of dental services and oral-hygiene practice.

Results: Only 2.31% of examined children visited the dentist by the end of the first year of life and almost 50% of the preschool children have not yet been at the dental check up. From the children 10% visited the dentist for the first time due to toothache. Only 23.53% of examined preschoolers use dental services regularly every 6–12 month and the majority of them (64.71%) visit dentist occasionally and 14.29% of the parents do not practice oral hygiene at their one-year-old children.

Conclusions: Parents' behavior and knowledge about the importance of early and regular use of dental services and good oral-hygiene for their children, is unsatisfactory. Further action in oral health education is necessary for this population.

P22-382

Prevalence of temporomandibular disorders in young childrenM. GIRAKI¹, R. PITROU², M. OMMERBORN¹, W. RAAB¹ & L. PAPAGIANNOULIS²¹*Department of Operative Dentistry, Periodontology and Endodontics, University of Duesseldorf, Dental School, Germany;*²*Department of Paediatric Dentistry, Dental School, University of Athens, Greece*

Background: Signs and symptoms of temporomandibular disorders (TMD) can already be seen in childhood and seem to increase with age. Prevalence-data vary widely due to different diagnostic criteria for definition and assessment of TMD. Data including young children with TMD, diagnosed by standardized Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD), are rare.

Aim: To evaluate the prevalence of signs, symptoms and apparent TMD-diagnosis in young children, assessed using the RDC/TMD.

Design: One dentist trained for TMD-examination clinically examined 300 healthy Caucasian children (3–12 years), all patients of Athens Dental School, for signs of TMD according to the RDC/TMD-protocol. The same investigator recorded anamnestic symptoms of TMD using a standardized interview of parents based on the RCD/TMD-questionnaire. TMD-diagnosis was determined according to the diagnosis-scheme of RDC/TMD. Exclusion criteria were current dental pain and diseases or medications that falsify TMD-diagnosis.

Results: The most common TMD-signs were temporomandibular joint sounds (19.7%) and muscle-pain on mandibular movement (23.0%), predominantly on vertical direction of motion. Midline deviations were observed in 5.3%. The most common symptoms associated with TMD were headaches (10.7%) and bruxism (20.7%) during the last six months. An apparent TMD-diagnosis was observed in 3.7% of children, whereby an increase with dental age could be registered (primary: 1.6%, early mixed: 2.9%, late mixed dentition: 6.4%).

Conclusions: Results indicate that signs and symptoms of TMD are common in young children. As apparent TMD-diagnosis is still rare at this age, sequel of TMD-signs and -symptoms has to be controlled to investigate a possible early onset of TMD.

P22-383

Risk factors and determinants of ECC in Catalonia, Spain

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Background: Early childhood caries (ECC) is a prevalent disease and a public health problem in Catalonia, Spain. Social determinants and risk factors in the most susceptible populations of Catalonia have not been reported previously.

Aim: To describe social determinants of ECC, as well as to determine nutritional and oral health habits related to ECC in two different populations of preschoolers in Catalonia.

Design: During 2010–2011 two populations were studied: 104 pediatric patients with ECC attending a hospital-based pediatric dentistry service and 129 healthy preschoolers. An oral health exam and questionnaire was completed.

Results: More than half of children with ECC come from low socio-economic status (SES) families and are recent immigrants. The mean dmft was 8.49. Most of these children are put to bed with a bottle or nurse on demand while they do not maintain good oral hygiene.

Compared to a group of preschoolers from the same area we found a significant difference in: parental origin, SES, oral hygiene and feeding habits.

Conclusions: Significant risk factors for ECC in this population, were socioeconomic status and parental place of origin, lack of oral hygiene and improper nocturnal feeding habits. This result shows that pediatricians and dentists should focus more on preventing and detecting early signs of ECC. New strategies in Spain Oral Health Programs should take into consideration these risk factors.

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Early childhood caries in Brazilian children—prevalence and indicators of caries risk

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Background: Early childhood caries (ECC) is a serious oral health problem. Epidemiologic studies and the identification of the indicators to caries risk (ICR) are necessary to plan, execute and avail the dental attendance services based in oral health promotion.

Aim: This study evaluated and analyzed clinically the oral health and the ICR of children from public and private schools of Alfenas and Areado, Minas Gerais-Brazil.

Design: This study involved 447 children (0–71 months of age). The evaluated oral health indexes were: dmfs (WHO, 1999); visible

biofilm-VB, (Ainamo; Bay, 1975) and gingival bleeding index – GBI (Carter; Barnes, 1974). A questionnaire showed the ICR. The oral health indexes were analyzed by *t*-Student test and, the ICR by Chi-square test and Multiple Linear Regression Analyses (MLRA). Statistical significance was established at 5%.

Results: The GBI = 0 for both municipalities. The *t*-Student test showed the lowest values of dmfs ($P = 0.0326$) and VB ($P = 0.0000$) for Alfenas. The same test has identified that VB was lower ($P = 0.0000$) for children with dental assistance and from public schools of Areado ($P = 0.023$). The Chi-square test showed that male gender ($P = 0.0053$) and frequency of visits to the dentist ($P = 0.0000$) have significantly influenced the ECC experience. The MLRA showed significance ($P = 0.0000$, $R^2 = 26\%$) between the dependent variable, ECC and the independent variables: male gender ($P = 0.0013$), brushing frequency ($P = 0.0000$), dental floss use (0.0485); smokers in family ($P = 0.0020$) and socio-economic status ($P = 0.0187$).

Conclusions: The professional preventive attention and the identification of the ICR are important to control the oral health.

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Cartography of fluorosis in Morocco

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Introduction: Dental fluorosis is endemic in Morocco and the highest rates have been reported in high phosphate zones.

Aim: To estimate the prevalence of dental fluorosis in population living in non-phosphate zones and identify determinants of dental fluorosis.

Design: A total of 2000 children and adolescents, from non-phosphate regions of Morocco, students of 1st–6th grades, 7–14 years old, were examined using the DEAN index and a questionnaire was also completed. In children with dental fluorosis information concerning the severity and etiology of dental fluorosis was collected. Estimation of fluoride levels in well water was performed at the CNRST (National centre for scientific and technical research).

Results: In the examined regions the prevalence of dental fluorosis varied between 88% and 98%. The content of fluoride in well waters in these regions varied between 0.5 and 8 ppm and dental fluorosis was more severe in regions where the concentration was high. Other determinants were frequent consumption of tea and fish as well as weather conditions.

Discussion: Dental fluorosis in the studied regions is related the exposure to high fluoride well water and to the determinants that were identified. The severity of dental is proportional to the accumulation of the factors cited above.

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Caries experience of 4 to 5-year-old children from Banja Luka, B&H

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*Department of Stomatology, Faculty of Dental Medicine, Banja Luka, Republic of Srpska, Bosnia and Herzegovina***Background:** Caries in primary dentition represents a public health problem that continues to affect babies and preschool children worldwide.**Aim:** The aim of this study was to determine at the prevalence of dental caries in 4 to 5-year-old children in the municipality Banja Luka.**Design:** A cross-sectional study was conducted in 177 children, aged 48–60 months from kindergartens in Banja Luka, B&H. Children were born, raised and lived in an area with a low level water fluoride. Subjects were examined in kindergartens according to WHO Oral health criteria. For inclusion in the study, the child should have an informed consent from the parents and no systemic disease. Caries status of deciduous teeth was described using the dmft index.**Results:** Results showed that the mean dmft index was 5.03 and there was no statistical difference between boys and girls. Only 39 (22.03%) of the examined children were caries free. Eighty (45.20%) of the examined children had six and more carious teeth. There were no children having fissure sealants placed. Seventy seven (43.50%) children had maxillary molars with caries and 84 (47.46%) of them had mandibular molars with caries. Thirty nine (22.03%) children had upper incisors with carious lesions.**Conclusions:** This study shows high caries prevalence in these children. In the future intensive preventive measures must be implemented effectively and be applicable to all children, for improvement of their oral health.

P22-387

Features of neurologic-and-behavioural and physical development in young children depending on iodine prophylaxis timing

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*Kabardino-Balkarian state University, Nalchik***Aim:** To investigate features of psychomotor and physical development in children up to 3 years-age depending on iodine prophylaxis timing.**Methods:** Study group consisted of 122 children from Nalchik pediatric polyclinic, grouped into four groups: 56 children whose mothers received iodine during pregnancy and children till 3 years-age (Group 1). 41 children who didn't receive iodine (Group 2). 11 children whose mothers received iodine during pregnancy, but children didn't receive iodine (Group 3). 14 children whose mothers didn't receive iodine during pregnancy, but children received it till 3 years-age (Group 4). The iodine dose was 250 microgram/day for women and 100 microgram/day for children from the moment of

birth till 3 years-age. All children were clinically healthy from mothers without endocrine illnesses. Neurologic status estimation, body weight and growth measurement were made at 1 day, 1, 3, 6, 9, 12 and 36 months with Cat/Clams scale and Denver screening test use. Nutritious status didn't differ. Statistical processing was lead by Statistica 6.0 for Windows.

Results: Differences were not revealed according to Cat/Clams scale. Denver test revealed higher level of fine motility and speech development at children of group 1 in comparison with groups 2, 3 and 4. Newborns' average body weight was 3280 g and till 3 years-age corresponded to norm without group differences. Growth of children of group 1 exceeded growth of children from groups 2 and 3 at a birth. Differences between groups 1 and 4 were not revealed. To 1 month growth of children from group 1 was 1 cm higher than from groups 2, 3 and 4. Given features remained till 3 years of age.**Conclusions:** Body length, fine motility and speech progress at 3 years children in groups with iodine prophylaxis in ante- and post natal periods were better.

P22-388

A comparative study of clinical effectiveness of fissure sealing with and without bonding systems: 3 year resultsC. SAKKAS¹, L. KHOMENKO² & I. TRACHUK²¹*Private Paediatric Dental Clinic, Nicosia, Cyprus;* ²*Department of Pediatric and Preventive Dentistry, The O.O. Bogomolets National Medical University, Kyiv, Ukraine***Background:** The fissure sealing is one of the most effective preventive treatments of occlusal caries.**Aim:** To evaluate the 3-year clinical fissure sealant (FS) success following use of bonding agents and traditional acid etch technique as well as to compare the occlusal caries incidence of sealed teeth using the two techniques over 36 months.**Design:** Subjects (86) aged 6.5–11.5 years-old were enrolled into two groups. In Group 1 (41) FS (Fissurit FX, VOCO) were placed in four permanent first molars (M₁-164 teeth) and in group 2 (45) in four permanent premolars (P₁₋₂ 182 teeth), using the bond sealing technique: Optibond FL (OpFL), Optibond Solo (OpS) (Kerr), Prompt-L-Pop (PLP) (3M ESPE) and acid etch technique (control sealing) for each group (split-mouth design). Sealant retention was scored as: (i) complete retention; (ii) partial loss; (iii) complete loss of FS. Wilcoxon Signed Ranks test was used to analyze the data.**Results:** The complete retention rate was: OpFL 80.07–82.92%, OpS 74.27–73, 78%, PLP 42.84–53.65% *versus* control sealing (etch technique) 62.86–71.44% in M₁ and P₁₋₂ ($P < 0.05$). The caries incidence rate was: OpFL 2.85–2.43%, OpS 2.85–4.76%, PLP 34.28–24.4% ($P < 0.05$) *versus* acid etch technique 17.14–16.66. ($P < 0.05$) in M₁ and P₁₋₂. A statistically significant difference in retention rate (PLP and etch technique) was found between M₁ and P₁₋₂.**Conclusions:** It may be concluded that the use of OpFL and OpS yields better sealing performance. PLP sealing can be used as 'temporary treatment' in case of children with poor moisture control and cooperation.

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A unique case of erupted complex odontoma

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Introduction: Odontomas are the most common type of benign odontogenic tumor composed of enamel, dentine, cementum and pulp tissue and they constitute 22% of all odontogenic tumors of the jaws. Some authors refer to it as hemartoma, and not as a true tumor. They are usually asymptomatic intrabony lesions often diagnosed during routine radiographic examination and usually associated with tooth eruption disturbances. Here is a unique case of complex odontoma which erupted into the oral cavity.

Case report: A 14-year-old girl presented with the complain of pain and swelling in the lower right second molar region. The radiographic examination revealed unerupted 47 and a radiopaque mass measuring approximately 3cm in diameter overlying the crown of 47. Histopathology examination confirmed diagnosis of complex odontoma. At the one year follow-up examination, tooth 47 had spontaneously erupted in full occlusion.

Comments: Eruption of an odontoma in the oral cavity rarely occurs. Most common presenting symptoms of this lesion are pain, swelling, infections and also most commonly associated with an impacted tooth. The low occurrence rate of complex odontomas makes this case more interesting.

P23-390

Prevalence of molar incisor hypomineralization in the city of Buenos Aires

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Background: Prevalence of Molar Incisor Hypomineralization (MIH) remains still unknown in our country.

Aim: Is to a) estimate prevalence of MIH in a group of children seeking for dental care in Buenos Aires, b) analyze distribution according to year of birth and c) compare prevalence and severity of MIH in children with differences in the access to health care services.

Design: A transversal prospective descriptive observational study was carried out in children who demanded dental care in the Pediatric Department of the Faculty of Dentistry of the University of Buenos Aires (Group B) and in three private pediatric offices of the team members located in the city of Buenos Aires Group A (Kscore > 0.9111) in the period between April and August 2010.

All children born between 1993 and 2003, ($n = 1098$) with all first molars and permanent incisors erupted were evaluated in the study. Obtained data were analyzed using descriptive statistics; Fisher's Exact Test and Linear regression.

Results: Prevalence of MIH was 15.9% (13.8–18.2). A high positive correlation was obtained between MIH and birth year ($P < 0.0001$). Group A: comprised 586 children and B 512 with prevalence of MIH 24.40% in Group A and 6.44% in Group B ($P < 0.0001$). Thirty seven percent of affected molars (range 32.2–42) in Group A and 13.7% (range 6.7–23.8) in Group B showed Grade three lesions with enamel breakdown ($P < 0.0001$).

Conclusions: This study showed MIH as a frequent pathology (15.9%) with a significant increase during the studied period. Patients with better access to health care services showed higher prevalence and degree of severity of MIH.

P23-391

Dental crown anomalies survey among students of the whole guidance schools in Rasht city

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Background: Dental anomalies often become of its orthodontic and aesthetical problems is a controversy. These abnormalities due to number size, morphology and dental structure cause of jaws arch problems and malocclusions.

Design: In this study were considered 2752 case that 1466 male and 1286 female. In age range of 12–15 years. Dentistry mirror and light and sterile send for examination, designed questionnaire, quils, mesiodistally determining chart of normal occlusional teeth and finally all cases have digitally figured. This is a cross sectional study on which the instance were studied as a cereus with direct examination carried out through all guidance schools of rasht. The data analyzed by SPSS-soft were and using chi-square test.

Results: Of 2752 cases, 59 cases had a dental crown developmental anomaly. That 34 cases were female and 27 male (54.2% as male 45.8 as female). There appears to be a statistical significant difference between the dental anomalies incidence and the type of dental involvement which the laterally superior teeth were the most prevalent involvement.

Conclusions: In this study, where as the most common abnormalities respectively were dens in vagination (57.4%), microdontia (35.6%), talon cusp (3.4%) macrodontia (1.7%) and fusion (1.7%).

P23-392

Chromogenic microorganismR. M. EFIGENIO GOMES¹, C. PALMA² & D. COSTA³¹*Faculty of Dentistry, University of Lisbon, Clínica Pequenos Grandes Doutores, Lisbon, Portugal;* ²*Faculty of Dentistry, University of Barcelona, Spain;* ³*Clínica Pequenos Grandes Doutores, Lisbon, Portugal*

Background: The extrinsic tooth pigmentation is usually caused by certain foods or drinks, drugs, tobacco or amalgam. Chromogenic bacteria, such as *Prevotella melaninogenica*, are related to the plaque with black/dark brown colour, commonly called the 'black line'. The presence of these bacteria, despite the non esthetic appearance, has been associated with a low incidence of caries.

Aim: The aim of this paper is to provide guidance to dental professionals and presentation of clinical cases, the etiology, prevalence, microbiology and removal of extrinsic pigmentation caused by chromogenic bacteria.

Design: (i) It is to provide data for an extensive literature review on the chromogenic bacteria. (ii) to present clinical cases of children who attend the outpatient pediatric dentistry with chromogenic bacteria have been selected, and after having their informed consent.

Conclusions: Despite the fact that prevalence of children with chromogenic bacteria is not high, all the dentists and dental professionals must possess adequate knowledge and skills in order to reassure patients and family, who are usually very anxious due to the esthetic problem.

P23-393

Three siblings with ectopically erupting maxillary first permanent molars: a case report

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Introduction: Ectopic eruption of the maxillary first permanent molar may result in the molar erupting mesial to its normal path of eruption. This often causes an atypical resorption distally on the second deciduous molar with eventual pulpal exposure or premature exfoliation and subsequent space loss. The aetiology is unclear but a genetic component may exist.

Case report: The eldest of three siblings presented complaining of acute pain from her left maxillary deciduous second molar due to pulpal exposure from an ectopically erupting maxillary permanent molar necessitating extraction of her upper deciduous second molar. She also had a missing lower deciduous incisor but no hypodontia in the permanent dentition. Examination of the younger siblings (fraternal twins) revealed ectopic eruption of

their left maxillary first permanent molars. Removable appliance therapy to distalise the ectopic molar of the female twin failed due to lack of co-operation. The male sibling was treated successfully with a sectional fixed appliance. Examination of the parents revealed peg lateral incisors in the father's dentition.

Comments: This case report lends support to the theory that there is a genetic component to the inheritance of a spectrum of dental anomalies with variable expression. It also shows that early diagnosis and correction of ectopically erupting permanent molars is critical for the development of a stable occlusion and is an important component of interceptive orthodontic treatment.

P23-394

Intrinsic pigmentation in the primary dentition**associated with hyperbilirubinemia: report of a case**K. SEREMIDI¹, K. KAVVADIA¹, A. TSAMI², A. GOUNARIS³ & M. PAPADOPOULOU⁴¹*Department of Pediatric Dentistry, Dental School, University of Athens, Greece;* ²*Department of Periodontology, Dental School, University of Athens, Greece;* ³*Neonatal care unit, University of Thessalia, Greece;* ⁴*Neonatal care unit, General Hospital, Nikaia, Pireus, Greece*

Introduction: Green tooth pigmentation is attributed to oxidation of conjugated bilirubin, a hemoglobin degradation end-product in the serum, during tooth formative stages. The aim of this report is to present a child with severe pigmentation of his primary teeth with a 1.5 years follow up.

Case report: A 17-month Caucasian male was referred to our Department from his pediatrician due to severe discolouration of his primary teeth. Medical history revealed during his first month of life hyperbilirubinemia, due to cholestasis secondary to sepsis from infection with *Klebsiella pneumoniae*. Initial clinical examination showed a caries free dentition and teeth with normal shape and surface texture but with an unusual dark green pigmentation located mainly cervically in the crown. Considering the medical history, the diagnosis given was 'tooth discoloration caused by hyperbilirubinemia'. Parents were reassured that the pigmentation was associated only with esthetic concerns and advice for prevention was given. At the recall visit 18 months later, oral health status was good and the distribution of the pigmentation followed a chronological pattern with the deepest discoloration affecting the earliest formed dental hard tissues. Rehabilitation with composite facing was offered to the parents.

Comments: Green discoloration, although rare, can cause anxiety and discomfort to both parents and child, therefore it is very important to inform them that the only concerns regarding this condition are esthetic.

P23-395

Case report: hypodontia in a child with Fraser syndrome

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Introduction: Fraser syndrome is a rare autosomal recessive disorder of which there has only previously been one case report in the dental literature. This is the first to document hypodontia. The main characteristics of Fraser syndrome are cryptophthalmos, syndactyly and genital abnormalities. Orofacial findings reported are: facial asymmetry, cleft lip and palate, high arched palate, dental crowding, fusion of deciduous teeth, dental hypoplasia, malocclusion, and supragingival calculus.

Case report: A 15 year old girl with Fraser syndrome attended Bradford salaried dental services complaining of painful lower anterior teeth. Medically she had cryptophthalmos and anophthalmia with facial asymmetry, syndactyly, a single left kidney, narrow airway, and had had a hysterectomy. On clinical and radiographic dental examination she presented with hypodontia (18, 15, 25, 28, 38, 35, 42, 45 and 48), shortened roots especially the anteriors, a high arched palate, an anterior open bite with posterior crossbites and the lower anteriors had a titanium trauma splint fixed to reduce the mobility. Oral hygiene around it was poor and therefore the patient had calculus and gingivitis. The splint was removed followed by subgingival scaling with local anesthetic, fissure sealants of all posterior teeth, regular oral hygiene instruction and scaling, and occasional weekly use of chlorhexidine gel. She has been reviewed regularly for 1.5 years, and all remains stable with the lower anteriors now having only Grade I mobility.

Comments: This case demonstrates the possibility of hypodontia and short roots being part of the rare condition of Fraser syndrome.

P23-396

Truth within a tooth? Case report of management of type II Dens Invaginatus

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Introduction: Dens invaginatus (DI) is a developmental anomaly produced by an in-folding of the tooth germ during development, creating a small tooth-like structure within the tooth.

Case report: A 10-year-old boy with immature permanent maxillary lateral incisors (12 & 22) with Oehlers Type II DI presented with facial cellulitis associated with the 12 which was treated by removal of the DI. An avascular necrotic root canal existed to 18mm after which bleeding was encountered in the apical 4mm. Profuse irrigation with NaOCl, minimal instrumentation and intra-canal dressing with an antibiotic/corticosteroid paste (Odonto-

paste[®]) was performed. A five-month follow-up revealed continuation of root growth. No further treatment was conducted and eight months after initial intervention, almost complete root development with closure of the apex was observed with positive response to CO₂ testing. Tooth 22 had irreversible pulpitis with long standing purulent discharge and was treated by removal of the DI and chemo-mechanical debridement followed by Ca(OH)₂ dressing. Five months later, an apical hard tissue barrier was observed via a surgical microscope, subsequently the canal was obturated with an MTA apical seal and thermoplasticised gutta percha back-fill.

Comments: Tooth 12 appears to have revascularised and re-innervated. Patient factors such as young age, an immature root with an open apex, an acute infection concomitant with partial pulp viability and surrounding stem cells, minimal instrumentation of the root canal with profuse irrigation, and choice of intra-canal dressing may have contributed to this occurrence.

P23-397

Use of imaging technologies (X-ray, CT) for planning surgical treatment

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Introduction: Supernumerary teeth are infrequent developmental alterations that may manifest in any zone of dental arches and involve any tooth. The term mesiodens is usually used for a supernumerary tooth present at the midline of the maxilla between or nearby the two central incisors. Mesiodens can cause delayed or ectopic eruption of the permanent incisors, which can further alter occlusion and appearance. Various imaging modalities have been used in the dentomaxillofacial fields over the past few decades, none of them with entirely satisfactory results. Cone beam computed tomography (CT) has the potential to reduce the size and cost of CT scanners. When combined with application-specific software tools, cone beam computed tomography can provide dentomaxillofacial practitioners with a complete solution for performing specific diagnostic and surgical tasks, such as dental treatment planning.

Case report: The initial examination of our female patient discovered the hyperodontia of the maxilla. Our case demonstrates that the modern digital X-ray imaging and CT visualization can help us to diagnose not only shape but also the exact position of supernumerary tooth.

Comments: At maximum use of available imaging methods, in our case, X-ray intraoral film and OPG and the main 3D-CT visualization of the area can minimize the extend of the surgery, thereby increasing patient comfort at the surgery and significantly shorten the time of healing. This project has been supported by the Grant Agency of the Ministry of Health of the Czech Republic No. 9991-4.

P23-398

Management of enamel defects—two case reports

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Introduction: Enamel defects are manifested as hypoplasia and hypomineralisation. As these teeth are of poor quality in many cases, it would be prudent if they could be restored without any further destruction of the remaining tooth tissues. We present two cases in children of different ages, where such approaches were used for the restoration of the primary and permanent teeth.

Case report: (i) A 3^{1/2} years-old girl with signs of chronological enamel hypoplasia and hypomineralisation affecting all deciduous molars and the canines, with all four second primary molars most severely affected. The dentition was found to be caries free and an anterior open bite was noted. The child was complaining of sensitivity from the deciduous molars. It was decided to use preformed stainless steel crowns (SSC), without local anaesthetic or any tooth preparation for second primary molars. (ii) A 7 years-old boy with Amelogenesis Imperfecta, hypoplastic type with anterior open bite. In this case all deciduous molars although non carious were prepared and restored with SSC's under general anaesthesia at the age of five. Following eruption of non carious first permanent molars and upper central and lateral incisors gold onlays and composite build ups were applied respectively. No local anaesthetic and tooth preparation took place.

Comments: Restorations of non carious primary and permanent teeth with enamel defects can be done without local anaesthetic and tooth preparation. Risks and benefits should always be weighted and each case treated on its own merits.

P23-399

Dental anomalies in patients with cleft lip and palateS. THEYS¹, S. VELLUT¹, H. REYCHLER² & C. PILIPILI¹*¹Paediatric Dentistry and Dental Care for Disabled Persons, Université Catholique de Louvain, Brussels, Belgium; ²Oral and Maxillofacial Surgery, Université Catholique de Louvain, Brussels, Belgium*

Background: Many children have dental anomalies which could be isolated or associated to malformations.

Aim: The purpose of this study is to compare the frequencies of different non-carious diseases between patients with cleft and those found in the literature for a healthy population. So we can see if these diseases are more common or not in patients who come in our center.

Design: Data were recorded between 9th January 2008 and 21st January 2009 in the multidisciplinary consultation of the Albert de Coninck Cleft lip and Palate Center (Saint-Luc Clinical University

in Brussels). Data about the general situation of the patient and non-carious anomalies were collected during a clinical interview with children and their parent as well as after clinical observation, respectively. It was complemented by analysis of their medical file. The radiographic analysis was not taken into account because all patients do not have a ortho pantomogram or a radiographic status. Other problems such as dental caries, periodontal problems, and orthodontic disorders are not considered in this study.

Results: More than half of the patients with cleft lip and palate have at least one dental anomaly of number, shape or tooth structure. Abnormalities in the number of teeth are the most frequent (53% of patients). They are followed by abnormal constriction (16%), abnormal volume (9%) and abnormal shape (8%).

Conclusions: The observed frequencies of these dental diseases are higher in our sample of patients with cleft compared to that of the literature for a healthy population with the exception of enamel opacities.

P23-400

A rare case of three impacted supernumerary teeth in the maxillary restricted incisor region

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Introduction: Most of supernumerary teeth are found in the anterior maxilla, either as mesiodens or supernumerary lateral incisors, in which one or two teeth are seen in individual. However, more than three teeth without odontoma in the same region are very rare. Reports are limited about cases with more than three mesiodens. The present paper presents a case with three impacted supernumerary teeth in the maxillary incisor region and its treatment management with tooth extraction and observation of the eruption of impacted central incisor.

Case report: A 7 year 8 month boy (First visit: February 6th 2010) with Upper right central incisor not detected clinically. Radiographic findings: Upper right central incisor was impacted and three impacted mesiodens were observed. Treatment management: Three impacted supernumerary teeth were extracted under local anesthesia. No complication was observed. For space maintenance for the eruption of the right central incisor, a Nance appliance was placed. After 3 months of the operation, dental X-ray photography was taken and the normal direction of the impacted central incisor was confirmed.

Comments: The authors considered as a rare incidence the fact that more than three mesiodens were found in their patient. This is in agreement with the study by Padro et al who reported that more than three unerupted supernumerary teeth was found only in 6.33% of 79 individuals examined.

P23-401

Dentin dysplasia type II: a case report

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Introduction: Dentin dysplasia (DD) is an autosomal dominant hereditary disturbance in dentin formation. DD-II produces a grayish or brownish opalescent coloration in primary teeth. It is characterized by large coronal pulp chambers containing denticles in permanent teeth.

Case report: An 8 year-old Istanbulian girl patient was referred to the Pediatric Dentistry Department of Yeditepe University Dental School, due to discoloration of her teeth. The crowns of her teeth had normal morphologic characteristics, but the color of her teeth was slightly more yellow than expected for a patient of her age. The patient's medical history revealed no evidence of disturbance in general health. Radiographic examination revealed teeth with no pulp and root formation and teeth with roots of only a few millimeters in some teeth. Her radiographs revealed a generalized abnormal dental condition described by the submitting clinician as 'enlarged pulp chambers that extend down into the radicular portion of the teeth and exhibit calcifications consistent with pulp stones'. Also notable are the obliterated root canals. Dental examination of other family members was performed, and the family dental history was constructed. On the basis of the clinical and radiographic appearance, DD-II was suspected. The treatment plan was established on basis of dietary consulting, oral hygiene instructions, and a preventive treatment strategy.

Comments: The treatment of DD-II depends upon the age at which the diagnosis was considered. Where diagnosis and treatment occurs early in the life of the child patient, good aesthetics and function can be obtained thereby minimizing occlusal deficits and psychosocial distress.

P23-402

Management of children with hypodontia, the Kuala Lumpur Hospital experience

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Introduction: Hypodontia may affect a single tooth to multiple missing teeth and may produce malocclusion, with aesthetic and functional problems affecting the developing dentition. Both environmental and genetic factors can cause failure of tooth development. This paper will present the interdisciplinary management of children with hypodontia referred to the hypodontia clinic of the Paediatric Institute Kuala Lumpur Hospital.

Case report: The patients of the present case report were referred by various health practitioners such as general dentists, paediatricians and geneticists. Since the clinic has started to operate in 2009 and runs once in two months 25 patients were treated until now. The team, consisting of paediatric dentists and orthodontists, discuss about the clinical and radiographic presentation of each case, the management which might include orthodontic realignment, bite opening or space closure prior to the restorative procedures or preprosthetic surgery, and inform thoroughly the patients and parents. Sixteen patients (64%) were healthy and the rest of them had medical problems such as haemophilia, asthma or ectodermal dysplasia. The missing teeth ranged from a single tooth to complete anodontia. Restorative treatment offered to the patients included composite crown build-up, partial dentures, overdentures and full dentures.

Comments: Multidisciplinary management of patients with hypodontia is important so that appropriate treatment resulting in good function and aesthetics is achieved. Consequently, the child's morale and self-esteem are promoted and the patient's quality of life is improved.

P23-403

Management of talon cusp in children

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Talon cusp is a developmental anomaly characterized by the occurrence of an extra cusp shaped tubercle projecting from the palatal or buccal surfaces. In the anterior dentition, talon cusp projecting from cingulum area to incisal edge, while in the posterior dentition appear as accessories cusp on occlusal surface. The other name of talon cusp is dens evaginatus. The etiology is not well understood, but appears to have both genetic and environmental components. Similar to other abnormalities of tooth shape, talon cusp originates during the morpho-differentiation stage of tooth development. Talon cusp can make some problems such as occlusal, esthetic and phonetic interference, accidental fracture cusp, irritation of tongue, and caries. The treatment of talon cusp varies greatly according to disorder and level of severity such as no treatment, pit and fissure sealants, grinding, and extraction.

P23-404

Activity assessment of caries lesions in epidemiological surveys with preschool children

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Background: Lesions activity has rarely been assessed in epidemiological surveys of dental caries in preschool children, but this approach could be useful due to the currently reduction in caries prevalence and lesion progression.

Aim: To evaluate the impact of including caries activity assessment on caries parameters (dmft, dmfs, caries prevalence) among preschool children.

Design: The study was performed in Santa Maria, Brazil, during the National Children's Vaccination Day. 639 children (12–59 months-old) were included. Fifteen examiners using ICDAS and additional lesion activity assessment criteria performed the examinations. Dmft, dmfs, caries prevalence were calculated, considering all lesions using different thresholds of ICDAS. Afterwards, caries activity status was considered and inactive lesions were classified as sound in this second analysis. The same caries parameters were recalculated. The reduction and the number need to be assessed were also calculated.

Results: When including all visually detectable lesions (non-cavitated and cavitated), the dmfs, dmft and prevalence significantly increased (6.6%, 4.0% and 69%, respectively) compared to the values when only active lesions were considered (5.7%, 3.5% and 63%). At cavitated threshold, the reduction was lower: 10% for dmfs (all lesions = 2.3; active lesions = 2.1), 9% for dmft (all lesions = 1.4; active lesions = 1.2) and 2% for caries prevalence (all lesions = 38%; active lesions = 37%).

Conclusion: Inclusion of activity assessment in caries epidemiological surveys has an impact on the dmfs, dmft and caries prevalence when non-cavitated caries lesions are included. The impact, however, is lower at cavitated thresholds.

P23-405

Supernumerary teeth in an urban Venezuelan population

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Background: Supernumerary teeth are those formed additionally to the normal dental series. They may be found in different locations, affecting adjacent teeth in variable ways.

Aim: To describe the prevalence and distribution of supernumerary teeth in a group of patients from Caracas, Venezuela.

Design: Panoramic radiographs of 550 healthy patients were retrospectively analyzed. Patients with syndromes or incomplete records were excluded. ST were classified in conical, tuberculate or supplemental. Affected apical areas were registered as anterior, middle and posterior left and right as well as maxillary and mandibular. Eruption status was recorded. Distribution according to gender, shape, location and eruption status was described.

Results: Mean age at diagnosis was 8.01 years ($SD \pm 3.05$), prevalence of ST was 4.55%, affecting 25 patients (8 female, 17 male). A total of 34 ST were observed, 16 patients presented one ST, and nine patients two ST. The shapes were 21 conical, eight tuberculate and five supplemental, with similar distribution between genders. 79.4% of all ST were located in the maxillary anterior apical area and 88.2% of all ST were non erupted. None of the tuberculate ST erupted. Females presented with ST only in the anterior maxillary and mandibular apical areas, whilst distribution of ST in males included all apical areas.

Conclusions: Frequency of ST in this study is slightly higher than previously reported. ST were more prevalent in males than females (2.1:1), the most common shape was conical, the anterior maxillary apical area was the likeliest location and eruption of ST was infrequent.

P23-406

Association of amoxicillin use and molar incisor hypomineralization in pigletsO. O. KUSCU¹, N. SANDALLI¹, İ. TURKMEN², S. DIKMEN² & E. ÇAGLAR¹

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Aim: The aim of the present study was to determine the prevalence of MIH in two groups of piglets where a group was given amoxicillin in infancy.

Design: A blind randomized clinical study was initiated in Pig Facility of Veterinary School, Uludag University, Bursa, where

three female healthy adult pigs (with no systemic disease history, and being life-long residents in the selected region) were selected to give birth to piglets. 20 piglets were given full-term birth and were randomly divided into three groups and each piglet was coded with a study number. Group A received a standard dose amoxicillin (Remoxil® 1 g injectable flacone) of 50 mg/kg/day in selected days of the month they were born. Group B received a high dose amoxicillin (Remoxil® 1 g injectable flacone) of 90 mg/kg/day in selected days of the month they were born: 5 days/a week. Group C did not receive any treatments and served as controls. The piglets were sacrificed at age 10 months after PFMs would attain occlusal level. Dental examinations were carried out by two calibrated pediatric dentists (OOK, EC). The four PFMs were examined wet for demarcated opacities and post-eruption breakdown under portable light source. Criteria for the diagnosis of demarcated opacities, post-eruption breakdown in PFMs due to MIH were developed by Weerheijm et al. In total, 80 PFM's were examined. **Conclusions:** While MIH is a multifactorial disturbance, the present study tries to highlight the clinical findings of a relationship between amoxicillin use and MIH.

P23-407

Idiopathic multiple internal resorption of primary teethJ. MONTEIRO¹ & A. CAMERON²

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Introduction: The physiological resorption of primary tooth roots is a complex yet poorly understood process. While resorption secondary to trauma is observed commonly, idiopathic internal resorption of multiple primary teeth is a rare occurrence.

Case report: We report the case of an otherwise fit and well 5 year old girl with idiopathic internal resorption of multiple primary teeth, resulting in rapid crown perforation, pulp necrosis and premature exfoliation. Her medical and family histories were unremarkable and there was no history of trauma or other intervention. All haematological and clinical chemical investigations were normal. Following clinical and radiographic examinations, a general anaesthetic was arranged in order to extract the unsavable and mobile teeth, take pulpal tissue for histopathological examination and to protect asymptomatic teeth, with pre-formed stainless steel crowns. Histologically, in those teeth that were not yet perforated, the pulpal tissue was found to be normal, other than the presence of odontoclastic and osteoclastic cells. No other inflammatory cells were found.

Comments: The aim of this report is to describe clinical, radiographic and histological findings of a case of idiopathic internal resorption of multiple primary teeth. Treatment options and possible diagnoses are presented.

P23-408

Effect of erythromycin on enamel formation on cultured mouse molars

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Background: In a recent study erythromycin use during the first year of life was found to be associated with molar-incisor-hypomineralisation. In another study a significantly higher risk for enamel defects was noted in first permanent molars for children with higher intake of macrolides over the first 3 years of life. An experimental study suggested that a macrolide caused enamel defects in rats.

Aim: Our aim was to study the effect of erythromycin on enamel formation *in vitro*.

Design: Mandibular first and second molar tooth germs of E18 mouse embryos were cultured for 10 day with erythromycin at concentrations of 0.05 mg/mL or 0.1 mg/mL. Control teeth were cultured without erythromycin. Morphological changes were studied from the whole tooth photographs. Enamel height from the cuspal area towards the cervical are of the mesial surface of the first molar and the height of the developing crown were measured by means of analySIS 3.00 (Soft Imaging System GmbH, Munster, Germany). The vertical enamel height/crown height ratio was calculated and used to assess the vertical enamel extent between the groups. Differences were tested by Mann-Whitney *U*-test.

Results: Exposure to erythromycin at a concentration of 0.05 mg/mL slightly reduced the extent of enamel but the difference was not statistically significant ($P > 0.05$). Exposure to 0.1 mg/mL erythromycin reduced the extent of enamel significantly ($P < 0.001$).

Conclusions: The results show that formation of enamel is reduced by erythromycin *in vitro*, suggesting that erythromycin disturbs enamel formation. The result may have clinical significance in molar-incisor-hypomineralisation.

P23-409

Impaction of primary teeth associated with odontoma

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Introduction: Odontomas are benign tumors of odontogenic origin, which exhibit complete dental tissue differentiation. Most odontomas are associated with permanent teeth and rarely with deciduous teeth. In most children, these tumors are associated with tooth eruption disturbances such as delayed eruption of the primary and permanent teeth or overly retained primary teeth.

Case report: A boy aged 2-year-old and 8 months presented with an unerupted right maxillary primary incisor. Panoramic and periapical x-ray revealed the presence of a radio-opaque mass

above the incisor crown. Spontaneous eruption of the primary incisor occurred after surgically removing this mass. Impaction of the upper right primary canine was observed in a girl aged 3 years. Presence of odontoma was confirmed by computed tomography and other x-rays. Full eruption of the primary canine occurred within 4 months after the extraction of the odontoma. A boy 5-year-old and 2 months with an impacted lower right primary second molar. Tiny radio-opaque mass, which caused the impaction, was observed above the molar crown. Although eruption occurred at a very slow rate, spontaneous eruption took place after surgically removing the odontoma.

Comments: Impaction of primary teeth is a rare condition and is most often associated with the presence of supernumerary tooth or odontoma. Signs of spontaneous eruption of all primary teeth were observed within 3 months of odontoma removal. Although traction is another useful treatment option for impacted teeth, one can expect the eruption of a primary tooth with a fully developed root only by surgically removing the odontoma.

P23-410

Management of double teeth

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Background: There is no published clinical protocol on the management of double teeth in the paediatric patient.

Aim: To review the literature on the management of double teeth to develop a clinical protocol in the management of this condition in anterior teeth in children.

Design: A Medline and Embase search was done for the following terms: 'double teeth', 'gemination', 'macrodontia', 'megadont', 'fused teeth', 'schizodontia', 'connation', and 'twinned teeth'. Articles in English that described the management of the teeth in the anterior permanent dentition in patients under the age of 18 were included in the study. Articles were reviewed to record a number of variables including width of tooth, type of anomaly, presence of incisal notching, root canal morphology, treatment provided, success criteria and follow up period.

Results: Fifty three articles were included in the final review. There was great variability in the success criteria and follow up periods. Twenty one papers had no success criteria and 21 papers not having any review period. Management options were found to be dependant on the root and root canal system morphology.

Conclusions: Better collection of data is required for patients who present with double teeth. The treatment success should be monitored for a minimum of 12 months and a set list of minimal criteria used to measure the success depending on the management strategy used. This will enable the formation of a protocol for the best management of various presentations of double teeth.

Poster Session P24/Cariology 2/Microbiology

P24-411

Primary teeth, as a cause of odontogenic infection

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Background: Odontogenic infection is a characteristic pathology that we often meet in our children. They are usually caused from untreated caries in both dentitions. Complications of odontogenic infections might be considered as a risk to the general health of children.

Aim: The aim of this study was to present odontogenic infections in children from the etiological perspective, respectively the primary predisposed teeth.

Material and Methods: In this study 370 children aged 3 to 10-year-old were included, from, both genders, from primary school and kindergarten in Prishtina. The dental status was determined using deft index. The dental examination was based on the criteria of World Health Organization for oral health assessment. The statistical significance was tested using Chi-square test for $P < 0.05$.

Results: The caries prevalence of the examined children was 94.3%, while the deft index was 7.5. The structure of deft index was: 75% for decayed, 8% for filled and 17% for extracted/missing due to caries. The most predisposed teeth in primary dentition for odontogenic infection was second primary molar (49.7%), then first primary molar (35%) and first primary incisor (9%), etc. According to localization in the jaw, odontogenic infections are most frequently in the lower jaw. (χ^2 -test = 11.28, $P < 0.01$). Odontogenic infections were manifested in clinical appearance of abscess, parulis, cellulitis and flegmona.

Conclusions: The untreated primary teeth are predisposed teeth that caused the odontogenic infections. Prevention and early treatment of initial caries can be associated with lower incidence of odontogenic infection.

P24-412

Approximal art restorations using a nanofilled coating: preliminary results

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Background: The failure of approximal ART restorations is related to mechanical properties of glass-ionomer cements (GIC). In spite of improving its properties and handling characteristics, the setting reaction of GIC indicated for ART is very sensitive and premature exposure to moisture can decrease the mechanical properties of this material.

Aim: The aim of this study was to verify if a nano filled coating influences the survival rate of approximal ART restorations.

Design: A total of 111 primary molars with approximal carious lesions were selected in 6 to 7-year-old children of Barueri city, Brazil. All teeth were treated and restored with Fuji IX (GC

Europe) following the ART approach protocol. The patients were randomly allocated in two groups: G1 – GIC coated with petroleum jelly and G2 – GIC coated with a nano filled coat (G-Coat Plus, GC). All materials were used according to manufacturer's instructions. The restorations were evaluated after 1 and 6 months according to Roeleveld et al. (2006) criteria. Mann-Whitney test was applied for differences regarding groups, and Wilcoxon test was performed to search for differences between time periods, in each group (5% significance).

Results: The survival rate of approximal ART restorations was not influenced by the use of G-Coat Plus in 1 ($P = 0.68$) and 6 ($P = 0.87$) months. Analyzing each group separately, there was significant increase in restoration failure between 1 and 6 months evaluations (G1- $P = 0.0039$ and G2- $P = 0.0020$).

Conclusions: The application of a light-cured protective coating after the GIC insertion does not improve the approximal restorations in early assessment.

P24-413

Effect of zinc ions on hydroxyapatite dissolution kinetics studied using scanning microradiography

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Background: Zinc (Zn^{2+}) is used in toothpastes and mouthwashes to reduce oral malodour as well as for its anti-calculus properties, but may also have a role in inhibiting the dissolution kinetics of hydroxyapatite (HAP).

Aim: To investigate the effect of Zn^{2+} metal cations on the surface physical chemistry influencing HAP dissolution kinetics by measuring the rate of HAP dissolution (RD_{HAP}) under strictly controlled thermodynamic conditions relevant to dental caries using scanning microradiography (SMR) at a range of Zn^{2+} concentrations.

Design: Compressed sintered HAP discs (Plasma-Biotol, UK) were sterilised, preconditioned, coated with acid-resistant varnish on all surfaces except one leaving one surface exposed to the demineralising solution, and located in the centre of an SMR cell. A bulk solution of 0.1% acetic acid pH4, divided into five (1 L bottle) with the addition of 0, 5, 10, 15, 20 ppm Zn^{2+} respectively was prepared. The demineralising solution was circulated at $0.80 \text{ cm}^3/\text{min}$. RD_{HAP} was measured using SMR at a single centrally located point on each disc for 24 h^{-1} at 22°C . Each experiment was repeated in triplicate using a series of demineralising solutions containing both increasing and decreasing Zn^{2+} concentrations.

Results: RD_{HAP} decreased significantly ($P < 0.05$) from 4.7×10^{-4} (with no Zn^{2+} added) to 4.0×10^{-4} , 3.13×10^{-4} , 2.91×10^{-4} , and $2.84 \times 10^{-4} \text{ g/cm}^2/\text{h}^{-1}$ at Zn^{2+} concentrations of 5, 10, 15 and 20 ppm respectively. The results were similar for both the increasing and decreasing Zn^{2+} concentration series.

Conclusion: Zn^{2+} reversibly decreases RD_{HAP} under strictly controlled thermodynamic conditions relevant to dental caries, possibly due to inhibition of dissolution nuclei on HAP surfaces.

P24-414

Contribution of enolase in fluoride-resistant

Streptococcus mutans

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Background: *Streptococcus mutans* is the principal causative agent of dental caries and fluoride materials are the most used chemical agent for controlling the disease. We meet sometimes children who have decayed teeth in spite of using home fluoride materials for prevention of caries routinely. This situation is usual reported by their guardian. We predict that fluoride doesn't work enough. There is possibility that they have some fluoride-resistant *Streptococcus mutans*.

Aim: It was reported that enolase is very sensitive to fluoride, and inhibition of this enzyme can result in a reduction of sugar uptake as well as glycolysis. Our aim is to investigate that how different sensibility of enolase in relation to fluoride some standard strains have.

Design: We selected four different *Streptococcus mutans* strains UA 130 and NCH105 which is reported as fluoride-resistant mutant strain were included. At first, four strains were checked growth in BHI with different concentration NaF. Second, permeabilized cells were made and enolase activities were investigated. At last, genetic sequences of enolase were compared across strains.

Results: UA 130 and NCH105 were more resistant than other strains in growth. Enolase activities used permeabilized cells were not indicated same tendency of growth. Gene analysis exposed UA130 and NCH105 had a point mutation at different area, so they had different amino acid.

Conclusion: It was shown there is possibility some strains have mutant enolase that is fluoride-resistant. It would appear that enolase mutation is one of contributory elements to get fluoride-resistance. We can just make sure of their oral condition. It was demonstrated that fluoride induces suppression of enolase which is an enzyme of glycolytic system. Benolase is important for existing strains.

P24-415

The effect of smoothies on enamel erosion

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Background: Smoothies are popular fruit drinks which showed increase in intake over the years. Although these drinks claimed to have health benefit, there is potential of these drinks to cause erosion due to the high fruit content. Scientifically proven evidence is important to help guide consumers about the consequences of taking these drinks.

Aim: The main aim of this research was to determine the properties of strawberries and bananas Smoothies (Innocent® pure fruit smoothie. London) as well as mangoes and passion fruit Smoothies (Innocent® pure fruit smoothie. London) and to assess the effect of these drinks on enamel erosion. The second objective was to compare the effects of Smoothies on enamel against Diet Coca Cola (Coca Cola Company, USA), after a 21-day pH cycling regime.

Design: A prospective randomised *in vitro*, pilot study using a 21-days pH cycling regime.

Results: Strawberries and bananas Smoothies (Innocent® pure fruit smoothie. London) and Mangoes and passion fruit Smoothies (Innocent® pure fruit smoothie. London) had pH level of 3.59 and 3.73 respectively and recorded to have high titratable acidity. Both Smoothies have caused statistically significant erosion to enamel after the 21-day pH cycling regime when compared with the negative control ($P < 0.01$) and similar effects as compared to the erosion caused by Diet Coke® (Coca Cola Company, USA).

Conclusions: The Smoothies tested were acidic with high titratable acidity, causing significant erosion to the enamel. The effects were statistically similar to the effect of Diet Coca Cola.

P24-416

Effect of ozone treatment on the composition of sound, acid-demineralised and carious dentinA. ANTYP¹, L. PAPAGIANNOULIS¹ & G. ELIADES²¹*Department of Paediatric Dentistry, Dental School, University of Athens, Greece;* ²*Department of Biomaterials, Dental School, University of Athens, Greece***Background:** Ozone treatment has been introduced for dentin disinfection.**Aim:** To test the hypothesis that ozone induces changes on dentin morphology and molecular composition.**Design:** Disk-shaped specimens of intact, acid-demineralized (10s 37% H₃PO₄ liquid) and carious dentin (early, moderate and advanced lesions) were prepared from extracted molars kept in water. The disks were studied by reflection FTIR microscopy at the same region before and after treatment with HealOzone (Kavo, GER) employing eight cycles of 40 s each, plus water-rinsing and air-drying. Any changes in the mineral to matrix ratio (MMR: Ca-P~1070 cm⁻¹/amide I~1640 cm⁻¹) on dentin surfaces (n:4 per group) after ozone treatment were normalized versus the values of native dentin and expressed in percentage. Optical microscopy and ESEM were used to evaluate changes in morphology. Kruskal-Wallis ANOVA on Ranks was used to compare the %MMR changes among the substrates (a: 0.05).**Results:** The changes in MMR were [%; mean (SD)]: +4.07 (0.46) intact dentin; +13.95 (3.70) acid-demineralized dentin; +5.60 (0.61) early lesions; +9.09 (1.22) moderate lesions and 0 advanced lesions. Significantly higher MMR changes were found in acid-demineralized and medium lesions versus the intact. The changes in the intact group were assigned to removal of loosely bound smear layer, whereas the changes in acid-demineralized and moderate lesion groups to additional degradation of exposed collagen. On advanced lesions, no mineral could be identified, suggesting the presence of a thick demineralized zone.**Conclusions:** Prolonged ozone treatment on acid-demineralized and moderately carious dentin specimens slightly increases the mineral to matrix ratio probably due to selective attack of ozone on exposed collagen.

P24-417

Restorative management of proximal class II cavitated carious lesions of permanent teeth. A new approachC.J. OULIS¹, M. SIFAKAKI¹, E. BERDOUSES¹ & P. LAGOUVARDOS²¹*Department of Paediatric Dentistry, Dental School, University of Athens, Greece;* ²*Department of Operative Dentistry, Dental School, University of Athens, Greece***Background:** Elective temporary separation of the teeth with orthodontic elastic separators gives direct visual access to the proximal tooth surface confirming the radiographic diagnosis by answering the question 'cavitation or not'.**Case report:** Two representative cases are presented among many others managed in the same way. They refer to two children aged 12 and 15 year-old, diagnosed radiographically of having one caries lesion each (Ekstrand 1997, codes 2 and 3) at the mesial surface of the first permanent molars. An elastic separator of double thickness was inserted between the contacting surfaces for

4–5 days and a space of about 2 mm was created. A definite diagnosis for a cavitated lesion was established and a consent form was signed by the parents. After local anaesthesia and placement of rubber dam, a high speed turbine with a #330 carbide bur was used in a horizontal direction buccolingually to remove caries. Provided that the thickness of the marginal ridge was at least 2 mm the restorative material (amalgam or composite resin) was inserted according to the manufacturer instructions and any excess was removed accordingly. An x-ray was taken to secure that the restoration does not have any excess and after the appropriate instructions for cleaning the area the patient was dismissed.

Comments: The main advantages of this technique are the conservation of the marginal ridge, the better control of caries removal, better aesthetics and the least possible surgical intervention. The main disadvantage is the two appointments procedure, which is counterbalanced by preserving more sound tooth structure compared to other cavity preparations.

P24-418

Influence of CPP-ACP and CPP-ACFP on surface characteristics of incipient enamel carious lesionT. PERIC¹, D. MARKOVIC¹, R. JANCIC HEINEMANN², V. RADOJEVIC² & B. PETROVIC³¹*Department of Paediatric and Preventive Dentistry, Faculty of Dentistry, University of Belgrade, Serbia;* ²*Department of materials science and engineering, Faculty of Technology and Metallurgy, University of Belgrade, Serbia;* ³*Department of Paediatric and Preventive Dentistry, Dentistry Clinic of Vojvodina, Faculty of Medicine, University of Novi Sad, Serbia***Background:** The aim was to evaluate surface characteristic of incipient enamel carious lesion after treatment with casein phosphopeptide-amorphous calcium phosphate (CPP-ACP) and casein phosphopeptide-amorphous calcium fluoride phosphate (CPP-ACFP) and to compare the efficacy with that of 0.05% NaF.**Design:** Forty enamel slabs were used. Following formation of the artificial carious lesion, they were divided into four groups (CPP-ACP, CPP-ACFP, 0.05% NaF, and control) and submitted to a chemical caries model. Remineralisation potential was examined using scanning electron microscope (SEM), energy dispersive spectroscopic (EDS) technique and microhardness test. SE microphotographs were subsequently analysed with image analysis software. Parameters that were analysed included area, minimal, maximal and mean diameter, range, roundness and number of enamel defects.**Results:** Treatment with 0.05% NaF reduced the number and the appearance of enamel defects to some extent when compared with irregular demineralised enamel. Treatment with CPP-ACP and CPP-ACFP resulted in occlusion of defects which produced more flattened enamel surface with less significant defects. There was a statistically significant difference between the treatment groups ($P < 0.05$) regarding characteristics of enamel defects. The EDS analysis did not show differences in Ca/O, P/O and Ca/P ratios between the groups ($P > 0.05$). Microhardness test revealed significant effects of CPP-ACP and CPP-ACFP ($P < 0.05$).**Conclusions:** Based on the results obtained, CPP-ACP and CPP-ACFP showed potential to remineralise incipient enamel carious lesion.

P24-419

Electronic data collection in a school-based prevention program

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Background: Forsyth was founded over 100 years ago with a goal of safeguarding the oral health of children. The ForsythKids staff of pediatric and general dentists, dental hygienists, and certified dental assistants deliver preventive dental care in schools using portable equipment.

Aim: Efficient collection of data in school-based prevention program.

Design: Each child receives an oral examination by a dentist. They receive a dental prophylaxis, pit and fissure sealants, fluoride varnish and in some cases sedative fillings if needed. The electronic data system facilitates comprehensive record keeping from the moment of consent through the delivery of care. Hand-held tablets are used chair-side that are secured through encryption to ensure privacy. There are two electronic recording forms. One records the dental information where number of teeth, type, caries, restorations, crowns, sealants, the presence of swelling, fistula or pain and if the dentist considers sealants are needed on any of the newly erupted teeth. If sealants are placed or a temporary filling, this is also recorded. On the second sheet, the soft tissue findings are recorded and any notes pertinent to the patient. Upon completion of dental visit, each child receives an electronically generated parent report signed by both the dentist and the hygienist. The report indicates if the child has an urgent need to be treated, and also if the child needs further care.

Conclusions: By collecting data in an electronic manner, information can be reviewed and evaluated on multiple platforms.

P24-420

Relationship between BMI, cariogenic diet and dental caries prevalence

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Background: Life style and food habits play a fundamental role as risk cariogenic factors in caries development. Over weight patients have an eating disorder that may increase their cariogenic risk. We study the relationship between BMI, Risk cariogenic diet and oral health.

Purpose: To establish the relationship between BMI cariogenic diet and oral Health.

Design: We conducted a comparative descriptive study in 227 children between 4 and 14 years of age in the Pediatric Dentistry Clinic, USS in 2010. Children were classified according to BMI group, under weight (108 children), normal weight (104 children) and over weight (15 children). The cariogenicity of diet was assessed by applying a questionnaire and was classified as high,

medium and low risk of cariogenicity. The results were analyzed using the Chi-square test and logistic regression.

Results: In relation to cariogenic diet and caries, the highest percentage of children without caries (dmf = 0) were found to be in the group of low-risk diet (21%) in the high risk group (5.2 %) and medium-risk group (15.8%) were significantly different ($P = 0.017$). In relation to BMI and dental caries, 108 under weight children, 18 children were healthy (16.7%) in the normal weight group $n = 104$, six were healthy (5.8%) and over weight children, were healthy 14 (6.7%) and significant differences ($P = 0.035$) for each of the groups. Logistic regression analysis showed that children with cariogenic diet were 3.4 times higher risk of ceo greater than 0.

Conclusions: The study shows that the most influential factor in the development of caries is the cariogenic diet.

P24-421

Longevity of direct proximal restorations on Class II cavities of permanent teeth after temporary tooth separation with elastic separators

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Background: Temporary tooth separation with orthodontic elastic separators is the only method giving direct access to proximal surfaces reduces diagnostic doubt and might facilitate a more conservative and lasting restoration.

Aim: To perform a long term clinical evaluation of «direct mesial restorations» completed after separation of the teeth and evaluate their median survival time in terms of material used and reasons of failures.

Design: One hundred seventy seven restorations were placed in 140 patients aged 10 to 15-year-old (median age 12.2 years) and followed for 1–12 years (median time 4.3 years). Eighty-eight amalgams and 93 composite resin restorations were placed randomly on carious lesions detected on bite-wings at the dentino-enamel junction (D2 and D3) and verified as cavitated after tooth separation. At every recall examination restorations were evaluated according to the modified Ryge criteria. Data were analysed by flexible parametric proportional-hazards and proportional-odds models for censored survival data with application to prognostic modelling and estimation of treatment effects at 95% CI.

Results: Of the 177 restorations, 11 (6.2%) failed. The median time to failure was 18.7 years. There was no statistical significant difference on the cumulative median time to failures between amalgam (16.4 years) and composite resins (20.0 years) in regard to caries development or marginal ridge fracture.

Conclusions: One surface restoration of proximal cavitated lesions in permanent teeth after tooth separation exhibited an extended and better life-span compared to conventional restorations and could be recommended as an alternative type of restoration for adolescents and type of lesions as in the study.

P24-422

Saliva sampling methods validation for a mutans streptococci test

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*Department of Paediatric Dentistry, Dental School, University of Athens, Athens, Greece***Background:** Commercial chairside mutans streptococci (MS) tests require inoculation with stimulated saliva, which is difficult to obtain in children.**Aim:** To validate the CRT bacteria test (Ivoclar- Vivadent) for the estimation of MS, using different saliva sampling methods, with the laboratory technique as the golden standard.**Design:** The study population consisted of 36 children, 7–10 years old. Stimulated saliva was used both for the CRT test inoculation and estimation of the MS levels with the laboratory technique. The CRT test was also inoculated with unstimulated saliva, collected using a) a plastic pipette, b) a sterile wooden spatula and c) a sterile piece of filter paper wetted with saliva from the buccal mucosa.

All sampling methods were validated by calculating sensitivity and specificity. Spearman's correlation coefficient was used for statistical comparisons among the sampling methods.

Results: The highest sensitivity of the CRT test (84.62) was found when stimulated saliva was used, while the second best (46.15) was found for the unstimulated saliva collected via a plastic pipette. Specificity was always higher than sensitivity, for all methods tested. Comparison among the sampling methods showed significant correlation only between the stimulated saliva method and the pipette method (0.42).**Conclusions:** Stimulated saliva used to inoculate the commercial CRT bacterial test yielded the highest sensitivity compared to the alternative sampling methods with unstimulated saliva.*This study was partially supported by Ivoclar-Vivadent Co.*

P24-423

Comparison of 4 methods for caries risk assessment in preschool children

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*Department of Paediatric Dentistry, Dental School, University of Athens, Greece***Background:** There is little information about the clinical value of different available methods for caries risk assessment in preschool children.**Aim:** Four different methods were compared for the classification of preschool children in high, medium and low caries risk categories.**Design:** In this cross-sectional study, the study group consisted of 814 preschool children. A questionnaire on family, demographic and socioeconomic factors, general health, oral hygiene and dietary behavior was completed by the parents. Children were examined for cavitated and white spot lesions (WSL). *Mutans Streptococci* levels and saliva buffer capacity were also measured. Caries risk

profiles were assessed using the methods of ADA and SIGN, the CAT and the Cariogram. The maximum number of caries risk factors was used for each method. The significance level for statistical testing was 5%.

Results: Cavitated lesions were found in 30% of the children and WSL in 26%. The children found at high risk were 96% with ADA method, 94% with CAT, 39% with SIGN methods and 25% with Cariogram. SIGN classified 52% of the children in low risk, while ADA, CAT and Cariogram respectively classified 0.2%, 2% and 8% in this category. The rest of the children were classified in the medium risk category. All the differences in the risk classification between the methods were statistically significant ($P < 0.05$).**Conclusions:** The four methods tested classify preschool children differently, with significant differences for both the high and low risk categories.*Research supported by Live.Learn.Laugh. Programme by FDI/Unilever*

P24-424

Cariogram profiles in preschool children with and without saliva tests

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*Department of Paediatric Dentistry, Dental School, University of Athens, Greece***Background:** Among the factors required for Cariogram to assess caries risk, are saliva buffer capacity (SBC) and *Mutans Streptococci* (MS) levels. These parameters require tests that are costly and difficult to apply in preschool children.**Aim:** To investigate the influence of SB Cand MS levels on caries risk assessment, with the use of Cariogram, in preschool children.**Design:** In this cross-sectional study, 814 children participated. For each child the caries risk was calculated with Cariogram, with and without the use of SBC and MS levels. The factors required for the Cariogram were data from clinical examination, performed in the classroom by three calibrated examiners, and from questionnaires completed by the parents. The children were classified in low, medium and high caries risk, according to the Cariogram assessment. Chi square statistics were used for statistical analysis and the significance level was 5%.**Results:** Dental caries at cavitation level was recorded for 30% of the children while 26% had white spot lesions. Good oral hygiene was recorded only for 31% of the participants. From the children, 25% were assessed as high risk with the full Cariogram, 30% without SBC and 42% without both SBC and MS levels. For low risk, the respective percentages were 8%, 5% and 1%. The differences between the three assessments were statistically significant ($P < 0.001$).**Conclusions:** The results of this study show that in preschool children, using the Cariogram without saliva tests, there is a significant increase of the high caries risk category.*Research supported by Live Learn Laugh Programme by FDI/Unilever.*

P24-425

Analysis of mineral compositional changes of enamel in questionable occlusal surfaces of permanent teeth compared to clinical assessment, radiography and DIAGNOdent measurements

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Background: The results of studies on the retention and effectiveness of sealants on questionable occlusal surfaces of permanent teeth are contradictory. A possible explanation might be a different enamel mineral composition of questionable occlusal surfaces.

Aim: To estimate whether the composition of enamel in questionable occlusal surfaces of permanent teeth is related to the clinical, radiographic and fluorescence characteristics of these surfaces.

Design: Human molars with questionable occlusal surfaces selected and classified according to the ICDAS II criteria (codes 1, 2, 3) by clinical examination and macrophotography, were radiographed and subjected to DIAGNOdent assessment. Then the crowns were longitudinally sectioned at the direction of the characterized lesions and studied by polarized light microscopy and SEM/EDX employing area and line scan X-ray analyses.

Results: The EDX analysis indicated changes in the Ca, P and C content, that were more prominent in 2 and 3 ICDAS II lesions. In these lesions the Ca/P atomic ratio was decreased (0.95-1.28 vs 1.64 in sound regions) implying the presence of regions with mineral depletion.

Conclusions: Enamel of questionable occlusal surfaces shows reduced mineralization alterations in comparison to sound enamel. This might necessitates further investigation of alternative methods of fissure preparation and etching for better sealant bonding on such substrates.

P24-426

Reversing white spot lesions and improving esthetics using an mi paste protocol

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Background: Generalized fluorosis and white spot lesions can have a negative physical and psychological impact on adolescent patients.

Aim: To improve the esthetics of young permanent teeth that had been altered by fluorosis and other white spot lesions.

Design: An 8 week protocol using MI paste in custom trays was established. Every morning and evening the patient brushed, flossed and loaded the custom trays with MI Paste. Facial and

buccal teeth surfaces were covered for 5 min. The patient was instructed not to eat or drink for 30 min. Once weekly, affected teeth were etched with 37% phosphoric acid for 1-2 min. Each tooth was rinsed and pumiced for 20 s. Following a rinse to remove pumice, the custom trays were loaded so all facial and buccal surfaces of the teeth would be covered. Trays were seated in the mouth for 5 min.

Results: The use of the MI Paste Protocol provided both white spot lesion reversal and esthetic improvement in young permanent teeth.

Conclusions: After following an 8 week protocol of non-invasive treatment involving MI Paste, a positive result, both physically and psychologically, was achieved.

P24-427

Action of photodynamic antimicrobial chemotherapy on human dental plaque

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Background: Biofilm is a complex aggregation of microorganisms which excrete a protective and adhesive matrix. It is involved in many microbial buccal infections, like dental caries. Several studies have shown that oral bacteria are susceptible to PDT in planktonic cultures biofilms. Photodynamic antimicrobial chemotherapy (PACT) is a nonantibiotic approach that uses the light to activate a photosensitizer molecule reactions involved in the process mediate the nonspecific killing of microbes.

Aim: This study evaluated the effect of this therapy in human natural dental plaque formed *'in situ'*.

Design: Volunteers wore a palatal appliance containing bovine enamel blocks during 2 days. A 20% sucrose solution was dripped onto the blocks eight times a day. The therapy was applied in biofilm formed on the blocks. Photosensitizer used was Toluidine blue and the light source was a diode laser (660 nm). The control groups were: no treatment; only photosensitizer, only laser or chlorhexidine solution. Serial dilutions were prepared with the dispersed plaque and they were seeded onto Brains Heart Infusion broth to determine the number of colony-forming units (CFU/g) of total microorganisms (TM). The data were submitted to analysis of variance and the Tukey test ($P < 0.05$).

Results: The number of TM wasn't significantly reduced with PACT, or with other control groups, except the chlorhexidine treatment.

Conclusions: *In vitro* and *In situ* studies must be performed to show the action of PACT on human dental plaque. Biofilms appear to be more resistant against the PACT than planktonic cells form treated with this therapy.

P24-428

Biofilms of the oral cavity of mother and her child, and theirs dental morbidity rateV. SHCHEGOLEVA¹, A. ANUROVA¹, V. ELIZAROVA¹ & V. TSAREV²¹Department of Paediatric dentistry, Moscow State University of Medicine and Dentistry, Moscow, Russia; ²Department of Microbiology, Virology and Immunology, Moscow State University of Medicine and Dentistry, Moscow, Russia**Background:** Abnormal formation of biofilms of oral cavity of human, leads to the development of major dental diseases.**Aim:** To explore the biofilms of oral cavity, dental health of the child and his mother, their relationship and dependence.

Twenty nine families were examined: 35 children 1–12 years and 29 mothers. The oral status and composition of biofilms of oral cavity (stabilizing microflora, aggressive part of the resident flora, anaerobic bacteria associated with periodontal diseases, viruses group of herpes) were examined.

Results: The prevalence of dental caries in children was very high and periodontal disease was detected in 98% of the subjects. Prevalence of dental caries in mothers was also very high, and periodontal disease was detected in all of them. Two-way analysis of variance without repetition, found an average non-linear positive correlation between the relative intensity factor of dental caries in the child-mother pair, with $P < 0.05$ ($K = 0.6$). Oral hygiene was identical in 56.6%. Total logarithmic microbial counts were as follows: children – 7.24 ± 1.36 ; mothers 7.38 ± 0.98 . In all of them dysbacteriosis was identified (III degree – 83.3% children, 87.5% mothers; IV degree – 12.5% children, 8.3% mothers). There was a high coincidence rate of microorganisms in the mother-child pairs.**Conclusions:** In all children and their mothers, pathogenic microflora were dominated;. Results show the necessity to carry out simultaneous treatment for mother and children both for dental caries and periodontal disease.

P24-429

Combined validity of VistaProof™ and indirect visual examination method for occlusal caries diagnosis in permanent teeth *in vitro*.K. SEREMIDI¹, P. LAGOUVARDOS² & K. KAVVADIA¹¹Department of Paediatric Dentistry, Dental School, University of Athens, Greece; ²Department of Operative Dentistry, Dental School, University of Athens, Greece**Introduction:** Although validity of different diagnostic methods for occlusal caries diagnosis has been extensively tested, their combination has been examined in a limited number of studies.**Aim:** To compare the validity of four different combinations of two examination methods on occlusal caries diagnosis in permanent teeth.**Materials and Methods:** One hundred seven occlusal pits from 41 extracted premolars were examined by one trained operator using indirect visual examination (IDV) and the VistaProof™ device (VP). Histological examination was used as the reference method to verify caries extend. Sensitivity, specificity and accuracy, were

calculated for each method separately as well as for the combination of VP with IDV. Statistical differences were evaluated using McNemar's test.

Results: Combinations of IDV and VP showed no significant differences among them, either in validity or in lesion categories ($P > 0.05$), although numerical differences were noted. Specifically, *sensitivity* calculated for combination no2, was higher from VP for all lesions and from IDV only for D3 lesions. *Specificity* was very close to VP and higher than IDV for enamel lesions. *Accuracy* was found higher than both methods for D1 lesions. In respect to the ability of methods to detect any lesion (D1 + D2 + D3), it seems that combinations had a higher sensitivity and accuracy but a lower specificity than both IDV and VP methods alone.**Conclusion:** Combination of IDV and VP improve one validity measure at the cost of another and for different lesion categories. Better results may be achieved with the combination of different methods for different lesion depths.

P24-430

Risk indicators for erosive tooth wear in brazilian preschool children: a panel studyM. S. N. P. CORRÊA¹, C. MURAKAMI¹, L. B. OLIVEIRA², G. A.V.C. BONINI², T. M. ARDENGHI³ & M. BÖNECKER¹¹Department of Orthodontics and Pediatric Dentistry, School of Dentistry of the University of São Paulo, Brazil; ²School of Dentistry, São Leopoldo Mandic Institute and Research Center, Brazil; ³Department of Stomatology, Universidade Federal de Santa Maria (UFSM), Rio Grande do Sul, Brazil**Background:** There are very few data on the prevalence and tendency of occurrence of erosive tooth wear (ETW) among preschool children.**Aim:** To assess the prevalence and risk indicators for ETW in children aged 36 to 59 months in the city of Diadema, São Paulo and to compare results found in 2008 and 2010.**Design:** A total of 967 children (2008) and 995 children (2010) were randomly selected and examined during the National Children's Vaccination Day. Sixteen examiners were trained and calibrated to use a modified version of the O'Brien index (1994) for ETW lesions and nutritional status was assessed using the WHO criteria (2006). Data on socioeconomic factors, nutritional variables, dietary habits and frequent exposure to gastric acid were collected using a questionnaire. Poisson regression model was used for data analysis ($P < 0.05$).**Results:** The prevalence of ETW was similar in 2008 (51.6%) and 2010 (53.9%) and most of the lesions found were confined to enamel. There were no significant associations between ETW and dental caries or socioeconomic, environmental, and nutritional variables. Risk indicators for ETW were daily soft drink intake ($P < 0.001$), drinking methods causing prolonged contact with the teeth ($P = 0.007$) frequent gastroesophageal reflux ($P = 0.005$), frequent vomiting ($P = 0.011$), and an increase in age ($P = 0.003$).**Conclusions:** In conclusion, a high and similar prevalence of ETW was found in this sample of preschool children in 2008 and 2010 and risk indicators included the frequency and method of soft drink intake, vomiting, reflux and an increase in age.

P24-431

Correlation of low birth weight with enamel defects & dental caries

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Background: Although Low Birth Weight (LBW) is a major public health issue in developing nations, its dental consequences have largely been ignored. Enamel defects and dental caries have been found to be associated with low birth weight of the children.

Aim: The present study aimed to identify if there is any significant association between LBW and enamel defects and dental caries in children.

Design: A convenience sample of 200, 2 to 6-year-old children was taken and divided into two groups: Group I of Normal Birth Weight (NBW) children and Group II of Low Birth Weight (LBW) children, 100 in each group. Gestational age, type of delivery, history of jaundice/ cyanosis /and blood transfusion at birth were also recorded.

Results: A highly significant difference was found in the prevalence of enamel defects between groups I and II, more children (84%) were affected in group II, signifying the association of birth weight with enamel defects. Types of Enamel defects have shown no significant difference in both the groups with 357 (42.8%) hypoplasias and 479 (57.2%) opacities. No correlation was observed between LBW and Dental caries.

Conclusion: Our study concluded a significant association between LBW & developmental defects of enamel. A correlation of enamel defects & dental caries was also observed. We suggest a 'multidisciplinary approach', which includes the gynecologist, the midwives in developing nations, the pediatricians and the pediatric dentist to target the population at risk and implement appropriate dental health education and preventive programmes.

P24-432

An *in vitro* study of the effect of high fluoride and of calcium sodium phosphosilicate toothpastes on pre-softened dentin

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Background: Although high fluoride toothpastes may have substantial cariostatic benefit for many high caries risk individuals, their effect may be insufficient to overcome certain aggressive cariogenic conditions. Therefore, recently introduced calcium – phosphate based remineralization technologies and among them a calcium sodium phosphosilicate system, may prove to be particularly valuable at promoting the process of mineral regain.

Aim: The purpose of this study was to comparatively assess the effect of high fluoride and of calcium sodium phosphosilicate toothpastes on dentin demineralization and remineralization.

Design: Pre-softened bovine dentin slabs were immersed twice daily in three toothpaste slurries: non-fluoridated (control), 7.5% calcium sodium phosphosilicate and 5000 ppm F, following a fourteen day pH-cycling protocol and subsequently they were

subjected to a 50 h acid resistance test. Lesions were assessed using cross-sectional Knoop microhardness technique. Also, Ca, P and Mg relative concentration profiles of representative lesions were obtained, by performing SEM – EDX line scans in carbon – coated specimen cross-sections. Furthermore, lesion morphology was imaged in secondary electron micrographs and finally, lesions were evaluated qualitatively using transmission and polarized light microscopy.

Results: The 5000 ppm F toothpaste group, during pH-cycling showed significantly less mineral loss and subsequently exhibited substantially increased acid resistance of tissue surface layers, compared to the other tested groups. The calcium sodium phosphosilicate group, during pH-cycling inhibited surface demineralization significantly more effectively than the control group, however, its acid resistance performance was similar to the control. These findings were confirmed by both secondary electron and light microscopic examination of the lesions.

Conclusions: Under these experimental conditions, the 5000 ppm fluoride toothpaste, promoted remineralization and inhibited demineralization more effectively, than the other tested toothpastes.

P24-433

The effect of space maintainers on oral microflora and periodontal health

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Background: Space maintainers are used for the preservation of the spaces left by primary teeth that are obliged to be extracted earlier than exfoliation time. However, appliances have disadvantages like plaque accumulation that can cause dental caries and periodontal disease or increase the prevalence of oral microorganisms.

Aim: The aim of this study was to determine the effect of fixed and removable space maintainers on oral microorganisms like Mutans streptococci (MS), *Enterococcus faecalis*, Lactobacillus and *Candida albicans*.

Design: Thirty four children were enrolled to study and divided into two groups: Group1: Need for fixed space maintainers, Group2: Need for removable space maintainers. Samples were taken from anterior-posterior palate, antero-posterior tongue, left-right cheek for Candida, using imprint culture method before placing appliances and oral hygiene education were given. The saliva samples were obtained for the determination of MS, *E.faecalis*, Lactobacillus and *C.albicans*. All measurements were repeated at first month of the usage of appliances. Comparisons of microorganism counts were evaluated according to dependent samples t-test.

Results: Microorganism counts increased in 23 of 34 patients. There were nosignificant differences between fixed and removable appliances regarding microorganism counts except for lactobacillus counts which increased significantly in removable space maintainer group ($P < 0.05$).

Conclusions: Special concern should be given on oral health of children who use space maintainers since they were found to cause an increase in lactobacillus counts in removable space maintainers. More effective oral hygiene educations are necessary for prevention of infections.

P24-434

Association of HLA-DRB1 and DQB1 with dental caries and colonization of mutans Streptococci and Lactobacilli in a child populationP. ALEMI¹, G. ANSARI¹ & R. SAFARALIZADEH²¹*Department of Paediatric, School of Dentistry, Shahid Beheshti University of Medical Science, Tehran, Iran;* ²*Department of Immunology, School of medicine, Tehran University of Medical Science, Tehran, Iran*

Background: Early childhood caries (ECC) is one of the most common diseases in childhood. ECC has a multi factorial etiology whit both genetic and environmental factors playing important role in the pathogenesis of the disease. Genetic variations in the hosts may contribute to the changes in the risk of caries development.

Purpose: The purpose of this study was to investigate a possible relationship between human leukocyte antigens (HLAs) DRB1 and DQB1, dental caries, and mutans streptococci (MS) and lactobacilli (LB) colonization in children.

Method: the genomic DNAs was extracted from whole blood samples of 44 patients with ECC and 35 caries-free children by the salting-out method. Fresh saliva samples were collected and tested for mutans streptococci and lactobacilli after which the subjects were placed into 2 groups, having either high ($\geq 10(5)$ colony-forming units [CFU]/mL saliva) or low ($< 10(5)$ CFU/mL saliva) numbers of micro-organisms in saliva. The genomic DNA was amplified by PCR-SSP and then HLA-typing was performed for all alleles.

Results: A reasonable increase was observed in the frequency of HLA-DRB1 in ECC group, while the frequency of HLA-DQB1 alleles was not significantly different between the two groups. An association between human leukocyte antigen alleles DRB1 and DQB1 and salivary numbers of MS and LB in the selected child population were found.

Conclusion: The above results suggest that HLA-DRB1 and DQB1 is associated with the susceptibility to ECC. So HLA-DRB1 and DQB1 detection as a molecular marker for early diagnosis of ECC may be recommended.

Poster Session P25/Dental Anomalies

3- Growth & Development 2

P25-435

Endodontic treatment of a periradicular lesion on dens invaginatus

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Introduction: Dens invaginatus is a developmental anomaly resulting in a deepening or invagination of the enamel organ into the dental papilla prior to calcification of the dental tissues. Although dens invaginatus is common, it may easily be overlooked because of absence of any significant clinical signs of the anomaly. The presence of an invagination is considered to increase the risk of caries, pulpal pathosis and periodontal inflammation.

Case report: 7-year-old female patient was referred for extraction of the upper left permanent lateral incisor. Clinical examination revealed extraoral swelling on left cheek area with tenderness to palpation, fever, and spontaneous pain. In radiographic examination, dens invaginatus with periapical radiolucency was confirmed in the left lateral incisor. Instead of extraction, endodontic treatment with vitapex® was tried. At 15-month follow-up visit, the tooth was clinically asymptomatic and disappeared periapical radiolucency in the radiograph.

Comments: Although there are several approaches to the management of dens invaginatus, the most important objective is preserve the health of the pulp, which can be achieved by early diagnosis and the prophylactic treatment. Where disease has developed, decision has to be made whether to treat the invagination and the pulp separately. Furthermore, surgical approach or extraction can be considered in more severe cases.

P25-436

A descriptive study on developmental anomalies of teeth in paedodontic patients in Istanbul

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Background: Developmental anomalies (DA) of teeth may express specific patterns in various populations.

Aim: The objective of this study was to assess the current prevalence and characteristics of DA of teeth in a population of paedodontic patients in Istanbul, Turkey.

Design: The study consisted a random sample of 1039 patients aged 5–13 years (546 boys, 493 girls) who visited the Department of Paediatric Dentistry of Istanbul University, Istanbul, between September 2010–January 2011. The patients were evaluated clinically and radiographically for the presence of talon cusp (TC), microdontia (MI), macrodontia (MA), tooth agenesis (TA), supernumerary teeth (ST), odontomas (O). The findings were

analyzed statistically according to gender, localization, number, morphology by chi-square test.

Results: Prevalance of the different DA were found as follows: TC 2.02%, MI 0.38%, MA 0.09%, TA 6.44 %, ST 4.33 %, O 0.19 %. The gender distribution showed no statistically significant differences ($P > 0.05$) in the prevalence teeth with TC, TA, MI. ST have been mostly observed in males ($P < 0.05$). TC and MI were occurred mostly on the upper permanent lateral incisors ($P < 0.05$). TC was seen mostly as bilateral ($P < 0.05$). Four cases of oligodontia, One case of partial anadontia, one case of MA and two cases of O were seen. The mandibular second premolar was the most frequently missing tooth (55.2%), followed by the maxillary second premolar (31.3%), and maxillary lateral incisors (28.4%). The majority of ST were mesiodens (64.4%); 46.6% of ST were conical, 66.6% were impacted, 6.6% were in inverted position.

Conclusion: Data reinforces the importance of early diagnosis of DA in the populations.

P25-437

The atypical oral manifestations of autosomal dominant osteopetrosis type II in a chinese adolescent

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Introduction: This paper describes an abnormal tooth root type with single-rooted first molars that occur in four successive generations in a Chinese adolescent.

Case report: The chief complaints of the proband, a 15 years old girl, was that her primary teeth did not shed. Oral examination, revealed that that all her molars were single-rooted, and the lower anterior primary teeth were retained, while some permanent teeth had not erupted. She had normal hair, nails, height, and weight. Orthopantomography x-ray demonstrated diffuse osteosclerosis involving the mandible. Bone radiology also demonstrated osteosclerosis all over the skeleton. A plain radiograph also showed vertebral body thickening and sclerosis and the pattern of 'bone in bone' in the pelvis. Blood examinations showed a mild anemia. Family history was investigated and it was found that six of a total of 28 family members in four generations were affected. The pedigree survey showed a typical autosomal dominant inheritance, so the diagnosis of autosomal dominant osteopetrosis (ADO) type II was come to confirm.

Comments: Autosomal dominant osteopetrosis (ADO) type II (ADO II; MIM 166600), the form originally described in 1904 by Albers-Schönberg, is the most common form with an estimated prevalence of up to 5.5/100 000. Clinical manifestations include non-traumatic fractures, especially of long bones, osteoarthritis of the hip and mandibular osteomyelitis. In this case, the main oral manifestations consist of atypical molars root defects. To our best knowledge, this is the first report of inherited single-root molars.

P25-438

Novel Mutation Detection of MMP20 and ENAM Genes Associated with Amelogenesis Imperfecta

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Background: Amelogenesis imperfecta is a group of inherited tooth disorders with abnormal enamel formation. Mutations in the *AMELX*, *ENAM*, *MMP20*, and *KLK-4* genes have been currently documented to cause amelogenesis imperfecta. Investigators are looking for mutations in other genes that may also cause amelogenesis imperfecta.

Aim: The purpose of this study was to detect novel mutation of *MMP20* and *ENAM* genes and the proteins derived from them which associated with amelogenesis imperfecta.

Design: Ten Iranian families with different patterns of inheritances were investigated by molecular genetic studies. Most of patients were in an autosomal recessive pattern. *ENAM* and *MMP20* genes, which account for majority of amelogenesis imperfecta and autosomally inherited, were chosen for mutation detection by single-strand conformation polymorphism (SSCP) analysis and DNA sequencing.

Result: Data analysis revealed genetic alterations of intron 5 of *MMP20* gene. Two patients with autosomal recessive inheritance had mutation in intron 5 of *MMP20*. Interestingly, these mutations have not been reported before, and, it seems, it was the first time these results demonstrated that other parts of these genes are prone to mutations in genes involved in tooth development. Results show no mutation detection in intron9 and exon 10 of *ENAM* gene.

Conclusion: These results support previous research findings that amelogenesis imperfecta may be result from mutation of *MMP20* and *ENAM* gene. Taken together these findings support *MMP20* as a disease gene, and opened a new window on the molecular mechanism of the AI disease and to the function of the amelogenin protein in enamel formation; however, identification of additional mutations could be helpful in establishing more knowledge about this disease.

P25-439

Dental anomalies in primary teeth and their correlation with the permanent dentition

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Background: Many studies have been carried out to investigate anomalies of primary teeth such as fusion, gemination, hyperdontia and hypodontia. However, additional studies are to be performed to know more about the likelihood of similar anomalies in permanent teeth.

Aim: The purpose of this research was to evaluate the likelihood of a correlation between anomalies in primary and permanent dentitions. Such correlation, if any, can assist in predicting the problems of permanent dentition and in managing the treatment procedures more effectively.

Design: This retrospective case-study research was undertaken on a group of patients referred to a dental clinic. One hundred and thirteen patients were diagnosed with anomalies including fusion, gemination, missing and supernumerary. Proper radiographs were taken and permanent successors were examined to detect possible anomalies.

Results: Fusion and missing teeth were recorded in 39 cases with the highest rates among all. Supernumerary teeth with 21 were in second level and the fewest number was in geminated teeth with 14 cases, most of which were in the upper jaw. Hyperdontia, nonetheless, was observed only in the upper jaw. Fusion in the lower jaw against upper was nearly four.

58% of patients with primary fusion and 75% of cases with primary missing were associated with missing in permanent dentition. Additionally among supernumerary primary teeth, 52% had hyperdontia in their corresponding permanent teeth. Geminated cases did not contributed with anomaly in permanent dentition.

Conclusions: Findings have shown that some primary anomalies may have corresponding anomalies in permanent successors, warranting inspection of permanent teeth before eruption to have an ideal preventive treatment plan.

P25-440

Joint anomalies of development of enamel and dentine

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Introduction: The etiology and clinical signs of anomalies of enamel and dentine development are diverse, but symptoms can be similar and this makes diagnosis difficult. The clinical situation shows a combination of a fluorosis and a syndrome of Stainton-Capdepont at one patient.

Aim: The purpose of the study is to present the medical and psychological condition of the patient after treatment.

Case report: Problems: restoration of tooth system function, elimination of cosmetic defect, prevention of complications. A situation: the 9-year child lives in the endemic center of a fluorosis with a quantity of fluorides in water of 2.1 mg/L. The patient complaints about tooth discoloration and shorting of crowns of the lower incisors. Patient's father has a similar clinical situation. The child's high incisors have chalk-looking enamel, with speckled pigmented defects. The enamel is gray and transparent. A dentine is dense and opalescence ('amber'). On the orthopantomogram, the length of roots is normal with channels of roots in permanent teeth with small width. At the lower incisors, there is no pulp chamber and no root channels. The diagnosis of a complex pathology a fluorosis and hereditary opalescence of a dentine is confirmed. Restoration of a proper correlation of jaws by means of orthodontic designs is recommended as well as sealing of speckled defects by composite materials is necessary. Pediatric dentist and orthodontist will collaborate in order to restore function and an esthetics.

Comments: Genetic consultation for revealing of hereditary factors of illness is recommended. The clinical situation shows expediency of the complex approach in preventive maintenance and treatment of similar patients, for their social intergradation after treatment.

P25-441

Breast feeding and early childhood caries

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Background: Caries prevalence in primary teeth, in spite of continuing reduction of dental caries, has established or possibly increased in some population groups. Improper feeding is one of the etiologic factors in early childhood caries (ECC). In some clinical trials breast feeding is mentioned as one of the causing factors in ECC. Results in this topic are different or even controversial. It is vital that all general advices given out are consistent with general health education messages.

Aim: This study was conducted to critically evaluate relationship between breast feeding and early childhood caries.

Design: According to a systematic review design, by using the medical databases and the systematic review of literatures, articles and guidelines, cited since 1995 – 2010, were selected. As well as related books and specific websites searched. Early childhood caries definition, breast feeding and other variables such as sample size, study location and study design were analyzed.

Result: According to data analysis, there was a lack of methodological consistency and inconsistent definitions of ECC and BE in literature, therefore, make it difficult to draw conclusions. Results about relationship between prolonged BF and ECC were inconclusive. There was a positive relationship between nocturnal BF and ECC. A history of BF didn't have any influence on caries incidence.

Conclusion: Because of the role of human milk in children's health, it's important to inform the parents about the possibility of dental caries due to nocturnal BF and instruct the preventive and hygienic instructions, especially in low socioeconomic population groups.

P25-442

Removal time of supernumerary teeth: optimal removal time

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Introduction: Supernumerary teeth are characterized by an excessive number of teeth and are relatively common in the oral cavity (0.5–0.99%). Time of diagnosis sometimes can be missed.

Case report: *Case 1:* A 5 year old boy visited the postgraduate department of Paediatric Dentistry, University of Athens to be treated for multiple caries. Treatment plan included an upper occlusal x-ray and extractions of upper anterior primary teeth. Patient did not follow recall examinations and returned after 18 months, due to pain. A new occlusal X-ray revealed two supernumerary teeth forming behind the permanent central inci-

sors, categorized in dental stage C 4–5 years (Demirjian 1978). After 9 months the patient returned for his recall examination and a new upper occlusal X-ray was taken. The supernumerary teeth had progressed to stage D 5–6 and were surgically extracted. *Case 2:* A 10 year old boy visited the private practice of one of the authors due to delayed eruption of the permanent upper incisor. An occlusal radiograph, revealed two supernumerary teeth blocking the eruption of the incisors. Parents produced a panoramic radiograph taken a year earlier that due to the bad quality was misdiagnosed. Surgical extraction of the supernumerary teeth was immediately followed by orthodontic traction.

Comments: Early diagnosis minimizes treatment needs and prevents associated complications with the permanent teeth. The age of 10 years old is considered the 'final' age for the surgical removal of the supernumerary teeth.

P25-443

Prevalence of molar-incisor-hypomineralisation in the district of San Bernardo, Santiago de Chile

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Background: Molar Incisor Hypomineralisation (MIH) was defined as 'a hypomineralisation of systemic origin of one to four permanent first molars frequently associated with affected incisors' (Weerheijm et al. 2003). The prevalence of this condition ranges from 3% and 50%. There are few studies conducted in America and in the case of Chile only one is known.

Aim: The aim of this study was to determine the prevalence of the MIH in children attending 4th grade (between 8 and 12 years old) in the district of San Bernardo, Santiago Chile.

Design: A stratified random sampling design was conducted with children ranging from 8 to 12 years old- an informed consent was given prior to the examination. In addition, a health survey for the participants was included in order to determine the systemic pathologies of children (0–3 years old) with MIH. The goal of the examination was to register the presence of MIH syndrome as well as its distribution pattern, severity in incisors and first permanent molars.

Results: Examination of 246 children showed prevalence of MIH 11.4%, but no significant statistical association between MIH prevalence and gender, gender and degree of severity, as well as prevalence and the affected site. Furthermore, a higher MIH prevalence was evidenced in the upper arch. The 89.3% of the students with MIH syndrome showed affection of the incisor group and the most affected teeth were 2.6, 1.6 and 3.6. A significant statistical association was found between the MIH prevalence and the presence of preeclampsia during pregnancy and ear infections in the first 3 years of life.

Conclusions: MIH prevalence for children of San Bernardo was 11.4%. An association between prevalence of MIH and the presence of preeclampsia during pregnancy and ear infections in the first years of life is suggested.

P25-444

Shape alteration of teeth in young patients

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Introduction: The esthetic improvement of anterior teeth in young patients is a necessity due to the special psychological aspects of the adolescence. However, this procedure must be carried out according to the principle of minimal intervention. Resin composite is the ideal restorative material, as it can provide almost perfect esthetic results with minimal preparation of the teeth. With the contribution of restorative dentistry clinical problems such as abnormal tooth shape, small lateral incisors, rotated and discolored teeth can easily be handled with the aid of resin composites.

Case report: The aim of this study is to present four clinical cases of young patients requiring tooth modification for esthetic improvement. Emphasis was given on the simple and conservative management due to their young age. At the first stage, photos and impressions were taken and diagnostic casts were created. Thereafter, diagnostic wax-up was produced and a silicon matrix was constructed to transfer the therapeutic scheme from the cast to the oral condition. After minimal tooth preparation, resin composite was placed, using the layering technique, to reproduce the appropriate shape and colour of the tooth.

Comments: Many cases of young adolescents can easily be managed using resin composites in order to provide, with minimal intervention, esthetic improvement of anterior teeth and smile, which is being necessitated by their age.

P25-445

The mouth breathing children, their characteristics and the possible relation with their academic performanceA. J. NOGUEIRA¹, R. NOGUEIRA², R. NOGUEIRA² & R. MIRANDA²¹Federal University of Pará – Brazil; ²Institution Superior School of Amazon – Pará – Brazil

Background: The Mouth Breathing Syndrome is the result of an altered breathing pattern, due to the decreased activity of the breathing muscles, making the air reaches the lungs by a mechanically short path. The carrier of this syndrome executes this breathing as a habit and unconsciously this leads to behavioral, postural and buccofacial characteristics.

Aim: The aim of this research is to identify the carriers of the Mouth Breathing Syndrome at the public schools of Belém-Pará and the possible influence in their academic performance. It also aims to alert their parents about the possible interferences and to guide them to the adequate treatment.

Design: The patient selection was done after a visual and clinical examination performed at the schools. The students' data and other alterations that characterized them as mouth breathers were annotated on specific charts. After that, a questionnaire regarding the students' performance and behavior was submitted to the

parents and teachers. Once the syndrome was detected, the parents were alerted to the problem.

Results: Two hundred thirty seven students from 4 to 11 years old were examined. Seventy-nine carry the Mouth Breathing Syndrome corresponding to 33.3% of the examined patients. Twenty-nine percent of the patients with the syndrome presented a regular academic performance, 62% presented a good academic achievement and 9% presented insufficient academic performance. Also, it was verified that the carriers of the Mouth Breathing Syndrome presented inferior academic performance when compared to the other 158 children that don't carry the syndrome.

Conclusions: There is a relation between the presence of the Syndrome and the academic performance of the examined children, and we believe that, when identified, we can intervene early contributing to improve these students' performance.

P25-446

Ankylosed carious primary molar affected development of permanent successorL. LIKAR¹ & A. PAVLIC^{1,2}¹Department of Paediatric and Preventive Dentistry, Faculty of Medicine, University of Ljubljana, Slovenia; ²Unit of Paediatric and Preventive Dentistry, University Medical Centre Ljubljana, Ljubljana, Slovenia

Introduction: Infraocclusion is a condition when a tooth is positioned 1 mm or more below the occlusion level. This condition is frequently associated with primary molars. If severely infraoccluded primary tooth has appropriate space provided to re-erupt and a permanent successor is present, normal exfoliation can be expected with a delay of 6–12 months.

This case reports aberrant permanent successor development placed under severely infraoccluded and ankylosed primary molar with a profound carious lesion.

Case report: A 4.5-year-old boy with multiple caries was referred to the Unit of Paediatric and Preventive Dentistry, University Medical Centre in Ljubljana, for dental caries treatment under general anesthesia. Intra-oral examination revealed multiple caries lesions in his primary dentition, and absence of tooth 85. The radiographic evaluation confirmed dental history on a submerged tooth 85. In crown of the submerged tooth a huge carious lesion was observed. A developing successor, tooth 45, was transposed and underdeveloped in comparison to a developing tooth 35. Under general anesthesia all caries affected teeth were either restored or extracted, depending on pulp involvement condition. The ankylosed tooth 85 was separated and extracted in two parts in order to avoid a traumatic injury to the underlying permanent tooth germs. Further development of the tooth 45 is being monitored.

Comments: An infraoccluded primary tooth with caries cannot only provoke severe pain but can also influence development of a permanent successor. When infraoccluded tooth with carious lesion cannot be appropriately restored it needs to be extracted in order to avoid further complications.

P25-447

Dens in dente

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Introduction: Dens invaginatus is a developmental anomaly resulting in the deepening or invagination of the enamel organ into the dental papilla prior to the calcification of the dental tissues. The prevalence is now estimated to range from 0.25 to 6.9 % depending on the classification method. The male to female ratio is reported 1:3. Maxillary lateral incisors are the most frequently affected teeth followed in decreasing frequency by the permanent central incisors, premolars, canines and molars. It is rarely seen in mandibular teeth.

Case report: A generally healthy 9-year-old girl visited the Department of Paediatric Stomatology seeking routine dental and orthodontic treatment. After a thorough medical and dental history, as well as an oral examination, a full mouth radiographic series was prescribed. Extra-oral exam revealed no significant findings. Intra-orally, gingiva and oral mucosa had a normal appearance. Patient was partially edentulous. Radiographic examination revealed dens in dente in maxillary left lateral incisor. Tooth was partly erupted and had a normal appearance at the time of the clinical examination. CT radiographic consultation was completed for the remainder of the teeth and the patient was referred for surgical and orthodontic therapy. 3D CT clarified the position of dens in dente including dimensions measurements. Tooth was surgically removed under general anaesthesia. Histological evaluation confirmed the diagnosis.

Comments: Diagnosis, prognosis, and subsequent treatment modalities are certainly affected by the morphology of the teeth. Radiographic examination is an essential part of the diagnosis and management of therapy. The basic information of 3-dimensional anatomy of teeth and adjacent anatomy is necessary in treatment planning.

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P25-448

Clinical effects of elastic traction technique in the closed eruption for complete bony impacted teeth

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Background: The impaction of permanent teeth is a common occurrence in children. The impacted pattern is complicated and the treatment is very difficult, especially for the deep bony impacted teeth. In recent years, research has led to the modified window technique and the closed eruption technique.

Aim: To evaluate the clinical effects of the elastic traction technique in the closed eruption for complete bony impacted teeth.

Design: Thirty-eight complete bone-impacted teeth in 35 children patients were included in the study. The radiographic locating position diagnosis was made. The impacted tooth was exposed by

means of a gingival flap and an orthodontic bracket was immediately fixed on the exposed tooth, a power chain hanged on the bracket, after which the gingival flap was repositioned using sutures. Orthodontic elastic traction was carried out.

Results: Thirty six teeth (94.7%) of 35 patients successfully erupted after orthodontic elastic traction. One patient with one impacted tooth dropped out the study. One tooth in one patient was extracted due to its proximity to the adjacent tooth and thus it could not be tracted. The average period of treatment was 7.5 months. Thirty-six teeth were integrated to the dental arch without any root or periodontal sequelae. The marginal shape of gingiva was normal. No infection occurred.

Conclusions: The elastic traction technique in the closed eruption results in a predictable effect in treating complete bony impacted teeth with few complications. The participation of a multidisciplinary team to accomplish the appropriate treatment of such patients is extremely relevant.

P25-449

Balancing extractions of primary teeth: comparative practices in three UK dental hospitals

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Background: A balancing extraction is the removal of a non-carious/restorable primary tooth and is a procedure advocated to maintain the symmetry of the developing dentition.

Aim: To compare practices relating to balancing extractions of primary teeth in three UK dental hospitals: Liverpool, Manchester and Sheffield.

Design: This was a prospective evaluation of children undergoing extractions of primary canines and/or molars over a 2-month period. The following information was recorded for each patient: age; gender; source of referral; caries experience of the primary dentition (dmft); radiograph investigations; number of teeth planned for extraction; number and notation of any balancing extractions and mode of treatment.

Results: Data were obtained for 102 children with a mean age of 6 years (SD = 1.89; range = 2–8 years). The mean dmft was 6.39 (SD = 4.02). Radiographic assessments were available for 65.7% (n = 67) of the patients; the most frequent radiographs being orthopantomograms (42%) and bitewings (40%). Overall, 17.6% (n = 18) of patients had one or more balancing extractions. The most frequently balanced teeth were upper (33%) and lower primary canines (33%). There were significant differences between the three dental schools for the frequency of balancing extractions (P < 0.05, chi squared test).

Conclusion: Management of balancing extractions varied between the three UK dental schools. The current national guideline is based on a low level of evidence and does not take into account other factors, such as caries experience or patient perspectives, in treatment planning. More comprehensive research is indicated to evaluate longer term benefits of balancing extractions in the primary dentition to inform future guidelines.

P25-450

Maximal interincisal distance in healthy school children in SwitzerlandH. VAN WAES¹, C. VAN LANGERWEGER¹, L. MUELLER¹, C. J. KELLENBERGER² & R. K. SAURENMANN³¹Department for Orthodontics and Pediatric Dentistry, Zurich, Switzerland; ²Department for Diagnostic Imaging, Children's Hospital, Zurich, Switzerland; ³Department for Pediatric Rheumatology, Children's Hospital; University of Zurich, Switzerland**Background:** A reduced mouth opening capacity may be one of the first clinical signs of TMJ pathology.**Aim:** To create age related percentiles for the maximal mouth opening capacity of healthy children.**Methods:** All recordings of the maximal interincisal distance as measured at the yearly dental examinations of school children in the city of Zurich, Switzerland, between August 2009 and August 2010 were extracted from the database. LMS ChartMakerPro version 2.3 (Medical Research Council, UK) was used to calculate age and sex related reference centiles.**Results:** Records from 22,060 dental examinations were found during the study period. In 1296 (5.9%) the maximal interincisal measurement was missing. Another 55 examinations were excluded because of missing data for sex (7), age at examination (11) or because the value was deemed to be pathologically low (37), (<25 mm in 3-9 year-old children, <30 mm in ≥10 year-old children). Thus, a total of 20,709 measurements (10,058 girls, 10,651 boys) were included in the analysis. The median age (range) was 9.92 years (3.25–18.33) for girls and 10.00 years (2.83–18.67) for boys. The mean interincisal distance (range) was 45 mm (25–69) for girls and 45 mm (25–70) for boys. Age related percentiles are presented for girls and boys separately, showing the 3rd, 10th, 25th, 50th, 75th, 90th, and 97th percentile from 3 through 18 years of age.**Conclusions:** In these 20,709 unselected school children the interincisal distance increased with age but showed a wide range within children of the same age.

P25-451

Prediction model of lower anterior alignment teeth in ethnic group deutromalayid children

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Background: In East Jakarta, Indonesia, 67.0% of Deutromalayid children, 8–10 years of age, suffer from misaligned lower anterior teeth.**Aim:** To formulate a prediction model for lower anterior alignment (LAA) in the early mixed dentition period, in Deutromalayid children.**Design:** Subjects were 47 Deutromalayid (26 boys, 21 girls), in early mixed dentition with well-aligned lower arch, Class I Angle, with 4 permanent incisors, and 2 deciduous canines. Every single crownwidth of lower incisors was measured and the sum formed the dental size data. The lower anterior arch dimensions were also measured perimeter (p), width (w), and height (h). The measuring method for dental size and arch dimensions were performed by study-model imaging (1:1 magnification), and the measuring tools was UTHSCSA Image Tools version 2.00⁷.**Results:** There were none-significant differences in dental and arch size between boys and girls, ($P > 0.05$). The differences of the perimeter to width and height were significant ($P < 0.05$). The prediction model of LAA by using linier regression was estimated to be: $P = a + (x1 \times w) + (x2 \times h)$, or perimeter dental arch = $(-2.02) + (1.05 \times w) + (0.65 \times h)$.**Conclusions:** The prediction model of LAA in early mixed dentition of Deutromalayid children, determined by perimeter (p), width (w) and height (h) of the lower arch was estimated. The measurements of the lower permanent incisors, the lower anterior arch and the prediction model are relatively same in boys and girls.

P25-452

Immunohistochemical staining DNMTs and HDACS during tooth development

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Background: Epigenetic alterations are crucial events for tissue development. DNA methylation and histone acetylations are two major epigenetic events. DNA methylations and histone acetylations are modified by DNA methyltransferases (DNMTs) and histone deacetylases (HDACs), respectively. Although epigenetic events may occur in the process of tooth development, it is still unclear how epigenetic modifications are observed in the process.**Aim:** To present a study investigating immunohistochemical localization of DNMTs and HDACs during the tooth development in mice.**Design:** Time-staged pregnancy female ICR mice were purchased from local suppliers.

The neonatal of ICR mice at 1 day after birth (P1) and 10 day after birth (P10), were used in this study. Dental germs of mandibular molar tissues from neonatal mice were fixed with 5% paraformaldehyde and embedded in paraffin. Dental germ tissues were stained with haematoxylin and eosin or immunohistochemical staining. The immunohistochemical staining of DNMTs and HDACs in dental germ tissues were performed employing anti-DNMT1, -DNMT3a, -HDAC1, -HDAC2 and -HDAC3 antibodies.

Results: We investigate the alteration of DNA methylations and histone acetylations during tooth development of neonatal mice by immunohistochemical staining. DNMTs and HDACs were decreased in dental germ tissue of ICR neonatal mice. The relative densities of DNMTs and HDACs staining were significantly higher P1 mice than P10 mice.**Conclusions:** These results indicate that expression of DNMTs and HDACs are probably playing a critical role in tooth development.

P25-453

Oral manifestations and orthodontic treatment of a girl with a history of acute lymphoblastic leukemia

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Introduction: The aim of the present study was to report the oral manifestations of a patient with acute lymphoblastic leukemia (ALL) as well as the orthodontic treatment plan and procedure. The understanding of the disease, oral manifestations and treatment may contribute a lot to the quality of life of these patients.

Case report: A 15-year-old female patient who was diagnosed with ALL at the age of 4 years old, underwent chemotherapy and radiation therapy and encountered relapse of the disease once. Dental records revealed generalized root shortening and arrested tooth development along with impacted upper canines and demineralized enamel surfaces. The treatment plan included fixed appliance therapy and exposure and traction of the impacted canines. The main concern was to avoid possible root resorption.

Comments: Orthodontic treatment of ALL survivors seems to be multidimensional and demanding. Special consideration must be given in patients who survived of ALL treated with either chemotherapy or radiation therapy or even the combination of the above in terms of tooth development and alterations in the eruption of permanent teeth.

P25-454

Maxillary midline diastema management. Is frenectomy necessary? A systematic review and meta-analysis

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Background: The presence of an abnormal labial frenum has been implicated in the etiology of large maxillary midline diastemas and is believed to contribute to retention problems in orthodontically treated patients. For many years, frenectomy has been advocated as an adjunctive method in diastema management. However, a systematic review of the relevant literature is still lacking.

Aim: The aim of the present systematic review is to investigate the changes in maxillary midline diastema after management with orthodontic treatment alone, frenectomy alone and combination of orthodontic treatment and frenectomy.

Design: Citations to potentially relevant trials were located by searching the appropriate databases. The random effects method for meta-analysis was used to combine the trial outcomes when

appropriate and the risk of bias was assessed by considering potential threats to validity.

Results: Five trials were considered appropriate for inclusion in the systematic review. Frenectomy alone was not efficient in the long-term in reducing maxillary midline diastema. Orthodontic treatment alone resulted in an increased number of relapse cases, which was decreased significantly when orthodontic management was accompanied with frenectomy in patients with abnormal frenum. Investigation of the parameters relating to the risk of bias showed increased risk of bias for most of the studies included.

Conclusions: No decisive conclusions on the effectiveness of frenectomy in the treatment of cases with maxillary midline diastema could be drawn based on the available data. Some studies may bear limited proofing ability due to risk of bias. Greater standardization of the methodology employed is desirable in future trials.

P25-455

Physiological root resorption in rats

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Background: Root resorption has been described on roots of teeth that have never been moved orthodontically. Apart from deciduous dentition, root resorption seems to occur as a part of the physiological tooth drift and regeneration of the periodontal ligament.

Aim: The aim of the study was to describe the physiological root resorption on root surfaces of rats and compare the extent of root resorption between the distal (pressure) and the mesial (tension) side of the roots, during their normal distal drift.

Design: Five 3-month old Wistar rats were used. Parasagittal sections of 6 µm thickness of the mandible were obtained. The sections were stained with haematoxylin and eosin and examined under light microscopy. Distal and mesial sides of roots of all three molars were evaluated. Non-parametric Mann-Whitney test was performed to compare the extent of root resorption between the two sides.

Results: Different types of resorption were observed on the roots. Superficial resorption was related to mononuclear cells, while deeper resorption lacunae were seen mostly at the pressure site of the roots. Earlier resorption lacunae, currently under repair were also present in both sides of the roots. The extent of root resorption was greater at the distal side of the roots.

Conclusions: Root resorption lacunae both superficial and deep were observed on the roots of rat molars. The severity of resorption was greater at the distal side of the roots, which is the pressure side during the normal tooth movement in rats.

P25-456

Prolonged molarless condition exacerbates aged-related deterioration of the hippocampus in SAMP8 miceM. IINUMA¹, H. NAKAHARA¹, M. ITO¹, S. MORI¹, Y. TAMURA¹ & K. Y. KUBO²¹*Department of Paediatric Dentistry, Asahi University School of Dentistry, Mizuho, Gifu, Japan;* ²*Seijoh University Graduate School of Health Care Studies, Fukinodai, Tokai, Aichi, Japan***Background:** Previous evidence suggests that toothlessness condition in aged senescence-accelerated prone (SAMP8) mice accelerates aging in the hippocampus.**Aim:** To determine whether tooth loss soon after tooth eruption (young age) has a greater effect on aging in the hippocampus than tooth loss later in life (old age), morphologic and behavioral studies were performed in SAMP8 mice.**Design:** Sixty mice were used. We compared the effects of early and late upper molar removal on plasma corticosterone levels, hippocampal neuron number, glial fibrillary acidic protein-positive astrocyte number, and spatial cognitive performance in the Morris water maze in SAMP8 mice. The mice were treated in accordance with the principles approved by the Council of the Japanese Neuroscience Society.**Results:** Plasma corticosterone levels were significantly higher in both groups compared with age-matched controls but did not differ between mice with short-term and prolonged toothlessness. Aged mice in the prolonged toothless condition had fewer hippocampal neurons in the CA1 and CA3 regions and a greater number of glial fibrillary acidic protein-labeled astrocytes in the CA1 and CA3 regions than aged mice with short-term toothlessness. In addition, mice with prolonged (8 mo) toothlessness showed significantly impaired learning in a water maze test compared age-matched mice with short-term (8 days) toothlessness.**Conclusions:** These findings suggest that a prolonged toothless condition exacerbates age-related deterioration of the hippocampus.

P25-457

Root resorption during orthodontic treatmentI. KAPOGIANNI¹, A. KOULI¹, I. LYROS² & M. MAVRAGANI²¹*Dental School, University of Athens, Greece;* ²*Department of Community Dentistry, Section of Orthodontics, Dental School, University of Athens, Greece***Introduction:** Apical root resorption is a common consequence of orthodontic treatment. Fortunately, only a small number of patients suffer from severe root resorption. Both patient- and treatment-related variables have been considered risk factors for orthodontic root resorption.**Case report:** The case of a patient that suffered from severe root resorption of the maxillary central incisors during orthodontic treatment will be presented. Factors that may have contributed to the extensive root length loss will be discussed. The patient, a 9-

year old boy was presented in our clinic having a Cl.II malocclusion with distal basal sagittal relation, retrognathic mandible and mouth breathing. The patient was congenitally missing three teeth (12, 15 and 25). Tooth 22 was severely malformed, with type 3 invagination, which penetrated through the root and bursted apically. Treatment with fixed appliances was initiated, which due to bad patient's cooperation was extended in length. During the fifth year of treatment, the patient suffered from trauma on maxillary central incisors. Control radiogram that was taken 1 year later, revealed extensive root length loss and treatment was interrupted to prevent further root resorption. During retention, special care was taken to prevent any traumatic occlusion of the resorbed teeth.

Comments: Several risk factors for orthodontic root resorption reported in the literature were present in this case. Even though orthodontic root resorption is considered unpredictable, careful examination of the documentation and solid knowledge of the existing literature may give us a hint for potential risk for root length loss during orthodontic tooth movement.

P25-458

Orthodontic micro-implants. Presentation of different cases

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*Department of Community Dentistry, Section of Orthodontics, Dental School, University of Athens, Greece***Introduction:** In the past few years the scientific interest for dental implants is progressively increased. Their application was also expanded in the field of orthodontics, where they were proved a useful and at the same time extremely functional tool in the hands of clinical orthodontist. The aim of our study is the presentation of the usefulness of mini-implants and their possibilities through the presentation of clinical cases that show the way of their application and their effectiveness.**Case report:** Different cases with the application of orthodontic micro-implants are presented. One of them presents an anterior open bitemalocclusion with the need of posterior teeth intrusion. The other two cases present need for spacing closure following extractions. The attributes and the characteristics of different types of micro implants used are described, that led to the choice of suitable micro-implant for each case. The places which were selected and the main points of the method of placement are presented. Finally, the conditions for the success are mentioned, but also their likely reasons of failure.**Comments:** By the application of orthodontic micro-implants, the total time of treatment is decreased, as extensive tooth movements are achieved, which traditionally require a complicated and time-consuming process with doubtful results. Their application is not difficult, but the essential knowledge and experience are absolutely necessary. Although orthodontic micro-implants are used extensively the last 10 years, still remain a field that needs further investigation in laboratory and clinical level.

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P26-459

Impact of treating early childhood caries with a caries risk approach on the nutritional status

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Background: Early Childhood Caries (ECC) is a multifactorial and complex disease related to inappropriate eating habits and lack of oral hygiene. Dental treatment of ECC based on caries risk approach includes identifying and addressing all caries risk factors. From the nutritional point of view it is important to assess the dietary habits as well as the body weight and height, as there is a bidirectional relation between oral and nutritional health.

Aim: To study the effect of treating ECC with caries risk approach on the patient's nutritional status.

Design: The weight-for-length index (WLI) was used to assess the nutritional status of 40 healthy patients (3–5 years old, mean age: 42 months) before and after receiving complete dental treatment for ECC with caries risk approach. The mean number of decayed teeth at the beginning of treatment was 9 (dmft). A mechanical balance and a vertical measuring rod were used. The nutritional classification is based on the National Center of Health (Chile). For statistical analysis chi square was used.

Results: Before starting dental treatment 60% of the children had normal nutritional status, 37.5% were overweight or obese and 2.5% underweight. At the end of treatment 75% of children had normal nutritional status and 22.5% overweight. Statistical analysis did not reveal significant difference ($P > 0.05$).

Conclusion: After treating early childhood caries with a caries risk approach, the percentage of children with normal nutritional status increased in 15%. Although this difference was not significant.

P26-460

Salivary concentration of the antimicrobial peptide LL-37 in young children

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Background: Salivary antimicrobial peptides belong to the first line of defense in the mouth. The peptide LL-37 is the human cathelicidin produced by neutrophils and epithelial cells. Lack of the peptide correlates with aggressive periodontitis in syndromes with neutrophil deficiencies, while increased LL-37 concentration is suggested to increase the caries resistance. No data exists on the salivary concentration of LL-37 in young children.

Aim: To study the LL-37 concentration in saliva of children in relation to the age, sex, type of dentition (primary, mixed or permanent) and the caries experience.

Design: Non-stimulated whole saliva was collected from 43 gingivitis-free children (19 males and 24 females), aged 1–18 years old. The type of dentition (10 with primary, 24 mixed, and nine permanent) and the caries experience (DMFT index) were

recorded. The concentration of LL-37 in the saliva was determined by ELISA. Data were summarized using descriptive statistics and non-parametric methods were used for hypotheses testing. All analyzes were performed with SPSS v.15.0.

Results: The median salivary concentration of LL-37 was 11 ng/mL (range 303). Irrespective of the sex, the concentration showed a positive moderate correlation with age and a negative moderate correlation with caries experience ($P < 0.05$). Children with primary dentition had lower LL-37 concentration than children with mixed or permanent dentition ($P < 0.05$).

Conclusions: The salivary concentration of the antimicrobial peptide LL-37 widely varies in children and increases with age. Caries-free children tend to exhibit higher peptide concentrations, which may imply a protective role of LL-37 against caries.

P26-461

Clinical efficiency of calcium glycerophosphate-containing gel with xylitol in the complex treatment of early childhood caries (ECC)

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Background: ECC is a very active form of dental caries that can destroy the primary dentition of toddlers and preschool children. Inclusion of newer strategies of remineralizing therapy into the complex treatment plan give promising results.

Aim: To evaluate remineralization properties of Calcium Glycerophosphate-Containing Gel with xylitol (10%) and Magnesium Chloride (R.O.C.S. Medical Minerals) in children with ECC.

Design: Eighteen 12 to 36-month-old children with ECC were included in this study. The complex treatment including applications of examined gel 5 times per day for 3 months at home was assigned to all patients. Fifty three teeth with smooth-surface caries (enamel caries $n = 27$; dentinal caries $n = 26$) were selected to study the remineralization properties of gel. Laser fluorescence (Diagnodent, KaVo) was used to monitor the changes in carious lesions at the baseline and after 3 months of gel applications.

Results: Ten children (experimental group) completed the treatment with full compliance; Eight children (control group) made applications irregularly and seldom, but came for the 3-months follow-up visit. In experimental group Diagnodent readings dropped in teeth: with enamel caries ($n = 15$) from 13 ± 0.98 to 7.33 ± 0.73 , with dentinal caries ($n = 16$) from 32.25 ± 1.82 to 25.25 ± 2.07 ($P < 0.05$). In control group Diagnodent readings increased in teeth with enamel caries ($n = 12$) from 11.58 ± 1.28 to 21 ± 1.64 , with dentinal caries ($n = 10$) from 31 ± 1.71 to 45.3 ± 1.91 ($P < 0.05$).

Conclusions: Calcium Glycerophosphate-Containing Gel with xylitol is an effective means of the remineralization of hard dental tissues. Motivation and discipline of the patients' parents are the main factors of the successful home remineralizing procedures.

P26-462

Salivary pH changes before and after drinking acidic beverages vs. sugared snacks in Tijuana Baja CaliforniaS. AGUIRRE¹, B. CASTRO¹, M. TORRES¹, A. GONZALEZ², V. GONZALEZ³ & I. VERDUGO¹¹Paediatric Dentistry Postgraduate program Universidad Autónoma de Baja California, Mexico; ²Facultad de medicina y psicología Universidad Autónoma de Baja California, Mexico; ³Facultad de odontología Valle de las Palmas Universidad Autónoma de Baja California, Mexico**Background:** Currently there is a significant increase of caries in children which attend the postgraduate clinic of pediatric dentistry in Tijuana. According to Shekinah 90% of children with excessive consumption of cariogenic diet are susceptible to decay. This is due to consumption of sugared snacks and / or acidic beverages that, while satisfying the consumer palatability, does not provide adequate nutrition nor dental health.**Aim:** This study identified the changes between the salivary pH before consuming these snacks or beverages and after in 59, 6 and 7 year old children who attend the 'Leonardo Valle' elementary school.**Design:** A Cross-sectional observational study was made in 59, six and seven year old children, who attend the 'Leonardo Valle' elementary school. A survey was made in the food mart of the same school, obtaining the frequency of consumption of sugared snacks and juices or soft drinks. The participating children took a saliva sample to determine the pH at baseline, with indicator strips (non-bleeding) before every meal and 2.5 h after the first sample.**Results:** From the 31 children who drank the acidic beverages 17 changed to an acidic pH, 3 to a basal pH and 11 children did not suffer any change. From the 27 children who ate sugared snacks 10 suffered an acidic change in their pH, 7 to a basal pH and 10 did not suffer any change.**Conclusions:** The difference between the 1st and 2nd saliva sample was of 63% in the beverages and 37% in the sugared snacks.

P26-463

Cavitated and non-cavitated incipient proximal lesions in primary teeth

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*Los Andes University School of Dentistry, Santiago, Chile***Background:** The incipient lesions represent earliest phase of caries or demineralization and are able to be reverted, stopped, or progress to cavitations.**Aim:** Establish relationship between cariogenic risk and cavitated and non-cavitated incipient proximal lesions.**Design:** This is an exploratory diagnosis study. Sample was randomly selected from a San Bernardo's school. Parents signed informed consent. Clinical chart for children was made. CRT bacteria, bitewing x-rays was taken bilateral conventional standardized interpreted by a dentomaxillofacial Radiologist. After 1 week, children were evaluated by visual examination, previous retirement of the separating elastics and prophylaxis with smoothbrush. Cariogenic risk was obtained by Cariograma de Malmö. The categorical variables were analyzed by Chi-square and continuous variables by T Student or ANOVA. Analysis of the predicting cariogenic risk factors by regression of Poisson in statistical package Stata 10.0 was used, considering *P*-estimates significant <0.05 to two tails.**Results:** All children presented at least one incipient proximal lesion. Twenty percent of the incipient lesions were cavitated, corresponding to 70% of the lesions found in the high risk and 30% in the moderate group respectively. Thirty-eight percent of the moderate risk patients presented incipient proximal lesions, of those 84% were non-cavitated and 16% cavitated lesions. High risk patients had 40% proximal lesions, 65% of them were non-cavitated and 35% were cavitated and statistically significant (*P* < 0.05).**Conclusions:** Patients in the moderate and high risk have greater tendency to present cavitations in incipient proximal lesions. This shows the importance of individual risk diagnosis to treat these incipient lesions opportunely.

P26-464

Detection of streptococcus mutans in human DNA samples from salivaA. MODESTO¹, K. DEELEY², E. CASTILLA³, F. SEYMEN⁴, M. L. MARAZITA² & A. R. VIEIRA^{1,2}¹Paediatric Dentistry, School of Dental Medicine, University of Pittsburgh, PA, USA; ²Oral Biology, School of Dental Medicine, University of Pittsburgh, PA, USA; ³ECLAMC at CEMIC, Buenos Aires, Argentina; ⁴Department of Paedodontics, Istanbul University, Istanbul, Turkey**Background:** *Streptococcus mutans* (SM) is the main species involved with the initiation of dental caries. Traditional quantification of SM with selective medium is laborious and requires that plaque samples are directly cultivated. A PCR-based method targeting SM glucosyltransferase genes was proposed to quantify the bacterial colonization in humans.**Aim:** The aim of this study was to test a real-time PCR assay to detect colonization by SM in human DNA samples.**Design:** Real-time PCR was performed by the use of the ABI PRISM 7900 Sequence Detection System (Applied Biosystems) to detect copies of genomic DNA from SM in 1,273 human DNA samples extracted from saliva. DMFT/dmft (Decayed, Missing due to caries, Filled Teeth) scores were available for all DNA samples utilized in this study. Values of the threshold cycle above zero were considered positive for SM based on the successful amplification of the target sequence. These values were correlated with DMFT/dmft scores and alpha of 0.05 was considered statistically significant.**Results:** It was possible to determine the presence of colonization by SM in both caries free and caries affected individuals. Values of the threshold cycle of the real-time PCR reaction correlate with higher levels of caries experience in children (dmft), but this correlation could not be detected for adults (DMFT).**Conclusions:** Real-time PCR can detect the presence of copies of genomic DNA from SM in human DNA samples extracted from saliva. These can be correlated to caries experience in children.

P26-465

Association between dental caries and central, peripheral and general obesity: findings from a chinese birth cohort

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Background: Although there has been considerable research into the relationship between dental caries experience and obesity, the results remain inconclusive.

Aim: To investigate the relationship between dental caries experience and three adiposity indices: waist-hip ratio (WHR), triceps skin fold thickness (TRSKF), and body mass index (BMI).

Design: A random sample of 668, 12-year-old children from the 'Children of 1997' birth cohort in Hong Kong was recruited. Clinical assessment for dental caries (DMFS) was conducted. Anthropometries for height, weight, waist and hip circumference, and TRSKF were performed. Children with DMFS ≥ 3 were defined as 'high caries experience' and those with DMFS < 3 as 'low caries experience'. Probabilities of developing high caries experience were examined through logistic regression analyses. Receiver operating characteristic (ROC) analysis and idiographic cases were produced to assess the discriminatory performance.

Results: The response rate was 76.9% ($n = 514$). The results of logistic regression analyses showed a significant association in high DMFS according to the children's WHR (OR = 1441.31, $P = 0.008$) and TRSKF (OR = 1.04, $P = 0.22$). The ROC curve proved that the area under the curve was 0.65 (0.57–0.72, SE = 0.04, $P = 0.001$). Idiographic cases of high DMFS among different groups demonstrated fair matchings with expected cases ($P = 0.25$).

Conclusions: While the occurrence of high levels of dental caries was positively associated with WHR and TRSKF within the 'Children of 1997' at 12 years of age, WHR had a stronger association than TRSKF with high caries experience.

P26-466

Determinants of early childhood caries in children with chronic respiratory diseases

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Background: Chronic Respiratory diseases are a diverse group of conditions affecting the lungs or respiratory track for a prolonged period. These chronic diseases are very prevalent in Chilean preschool children and their determinants for early childhood caries (ECC) has not been studied in this population.

Aim: The purposes of this study were to: (1) determine the prevalence of ECC; and (2) identify risk factors associated with the presence of ECC among children with chronic respiratory diseases.

Design: The study population comprised 120 children younger than 72 months. Sixty children diagnosed with chronic respiratory diseases were compared with 60 healthy children. Several risks factors for caries were included. The data were analyzed using chi square test. Logistic regression analysis was also employed for ECC.

Results: The results showed that children with chronic respiratory diseases had increased prevalence of ECC compared to healthy controls ($P = 0.001$). The logistic regression showed that those with respiratory diseases were significantly more likely to experience dental caries than children without respiratory disease. (odds ratio (OR) = 7.04, 95% confidence interval (CI) = 2.37 – 20.9). Four of the risks factors for ECC were significant: low birth weight ($P = 0.030$); preterm birth ($P = 0.010$); medication use ($P = 0.005$); parental education. (0.004).

Conclusions: The results indicate that Chilean preschool children with respiratory diseases have higher caries prevalence than healthy children. For the population studied the most caries risk factors for ECC are: medication use, parental education, preterm and low birth weight.

P26-467

Correlation between caries activity and counts of selected microbes in oral samples from children

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Background: *S. mutans* (SM) exhibits a higher prevalence in dental plaque whereas *S. sobrinus* (SS) is associated with increased caries activity and experience. Co-existence of SS and SM has been correlated with increased caries incidence. *Candida albicans* (CA) has also been associated with early childhood caries and caries activity in children.

Aim: To study the association between caries activity and populations of SM, SS and CA in dental plaque and saliva from Greek children.

Design: Dental plaque from buccal and occlusal tooth surfaces and stimulated whole saliva were collected from 46 caries free and 51 caries active children aged 3–13 years old. Microbial counts of SM, SS, and CA were determined from cultures on selective media and of the total facultatively anaerobic bacteria on Brucella agar. The correlations were examined with Spearman's rho test.

Results: In caries active children, the isolation frequencies for SM were 93%, 89%, and 87% in saliva, buccal, and occlusal plaque, respectively. Corresponding frequencies for SS were 18%, 18% and 19% and for CA, 34% in saliva and 20% in buccal plaque. In caries free children, the corresponding frequencies were for: SM 37%, 39%, and 39%, and CA 7% and 2%. SS was not detected. A significant correlation was found between caries activity and a) SM in saliva ($\rho = 0.612$, $P < 0.001$), in occlusal plaque ($\rho = 0.418$, $P < 0.001$) and in buccal plaque ($\rho = 0.267$, $P < 0.01$), b) SS in saliva ($\rho = 0.316$, $P < 0.01$) and c) CA in saliva ($\rho = 0.331$, $P < 0.01$).

Conclusion: In children, caries activity strongly and highly significantly correlates with salivary SM counts.

P26-468

An investigation into the dental health of children with obesity: an analysis of dental erosion and caries statusH. J. TONG¹, R. BALMER², T. MUYOMBWE³ & M. DUGGAL²¹Department of Preventive Dentistry, National University of Singapore, Singapore; ²Child Dental Health, Leeds Dental Institute, Leeds, UK; ³Centre for Epidemiology and Biostatistics, University of Leeds, Leeds, UK**Background:** Obesity is defined as having abnormal or excessive fat accumulation in body adipose tissue, and is probably the most common nutritional disorder among children in Britain.**Aim:** To investigate whether children with obesity experienced more erosion and caries than children from a control group.**Design:** Children with BMI > 98th centile were recruited from specialist Paediatric Obesity Clinics. The control group comprised of fit and healthy children with normal BMI-for-age. O'Sullivan Erosion index and WHO caries Index were used in the examination of erosion and caries respectively. Stimulated saliva flow rate, buffering capacity, *S. mutans* and *lactobacilli* counts (CFU/mL) were evaluated. A questionnaire survey was employed to collect information on demographic background, oral health history and habits, and utilization of dental care services. Statistical analysis was carried out using SPSS (ver 17) and Stata (ver 11).**Results:** Thirty two children between the ages of 7–15 years were recruited per group. Children with obesity were 26 times more likely to have erosion than healthy children, and tended to have more erosion in terms of severity ($P < 0.0001$) and area affected ($P < 0.0001$) but not in the number of surfaces affected ($P = 0.167$). Incisors were more likely than posterior teeth to be affected by erosion. Gender had no effect on erosion. There were no statistically significant differences in the DMFT and saliva profiles between the groups ($P > 0.05$).**Conclusions:** Children with obesity tended to have higher dental erosion. There was no difference in the DMFT and saliva tests and questionnaire results between the groups.

P26-469

In vivo comparison of erosion/pain from different pop-beverages in adults and children

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Background: Milk-teeth and adult-teeth have different characteristics. Both deciduous enamel and dentin are softer and thinner than adult-teeth. Chronic over-indulgence with pop beverages erodes teeth, and induces pain after swishing. Because calcium and phosphorous are released from teeth after consuming acid drinks, pop-guaraná and pop-colas were investigated *in vivo* for erosion and sensitivity.**Aim:** To compare results between children and adults for: (i) Calcium and phosphorous release after drinking pop-guaraná and pop-colas. (ii) Pain after swishing.**Design:** Six pop-guaraná drinks (four regular; two diet), and six pop-colas (three regular; three diet) were assessed. We used three

volunteer groups (first: adults dentate, second: adults edentulous and third: dentate children). Each subject rinsed aliquots of drinks for a half minute. Each expectorate was tested 12 times with standard chemical analytic methods. The pop-drinks from source and after-rinsing were analyzed for calcium and phosphorous with ICP-OES. Scores for pain (initial and after-rinse), were compared for each drink using VAS scales.

Results: We found significantly more calcium and phosphorous leach out after rinsing with colas and significantly less after rinsing with guaraná ($P < 0.01$ Students-*t*). Guaraná causes significantly less pain than colas in both adults and children. Children show increased erosion with colas, less erosion with guaraná and less pain than adults from both drinks.**Conclusions:** *In vivo* pop-Colas cause more dental pain in adults than children, and while both drinks are erosive, pop-colas are more erosive than guaraná in children.

P26-470

Effect of a short sucrose exposure of preschool children on caries experience in permanent teethI. HALUNEN¹, V. ANTTONEN^{1,2}, J. PÄKKILÄ³ & L. TJÄDERHANE^{1,2}¹Department of Paedodontics, Cariology and Endodontology, Institute of Dentistry, University of Oulu, Oulu, Finland; ²Oral and Maxillofacial Department, Oulu University Hospital, Oulu, Finland; ³Institute of Mathematical Sciences, University of Oulu, Oulu, Finland**Background:** In a randomized clinical trial preschool children used sucrose ($n = 149$) or xylitol ($n = 157$) chewing gum regularly for 2 months in 1995. Salivary mutans streptococci (*sm*) levels of children were measured at baseline. Survival time of primary teeth of children with high *sm* levels in sucrose group has been found to be significantly shorter compared with children in the same group with low *sm* levels and children in xylitol groups.**Aim:** This practice-based study aims to investigate dental effects of a short, regular exposure to sucrose at preschool age on permanent teeth.**Design:** Data for the study was achieved from dental records of the City of Oulu, Finland, of the original study group up to the year 2008. In analyses participants were divided into subgroups according to their exposure to sucrose/xylitol and *sm* levels. Kaplan-Meier method was used for survival analysis.**Results:** No significant difference was found in survival of permanent teeth (molars and upper incisors) between the participants in sucrose and xylitol groups. Survival of permanent teeth of individuals with high *sm* levels and having been in sucrose group was not different from those in other subgroups. Participants with high *sm* levels tended to have more caries lesions in first molars than those with low *sm* levels.**Conclusions:** The results indicate that short, regular exposure to sucrose at preschool age maybe sufficient to induce dental caries in primary teeth. In permanent teeth, however, the exposure did not induce caries. Caries predicts caries, if caries promoting circumstances persist.

P26-471

Clinical study evaluating restorative treatment using glass-ionomer cements in primary molar teeth, over a two year period

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Background: Fluoride-releasing adhesive materials such as Glass-ionomer cements might prevent the progression of decay when they are used as a minimally invasive treatment.

Aim: Two-year clinical study was carried out to evaluate the success rate of the treatment of primary molar teeth by using glass-ionomer cements as the filling material.

Design: The study included 77 children, aged 3–10 years and 136 teeth with medium-size caries and 46 teeth with deep caries adjacent to the pulp were filled with GIC and followed up. The treatment method was either ART technique using hand instruments or preparation using dental hand-pieces. During the study, the following GIC materials were used: Ketac Molar, Ketac Molar Easy mix, Fuji IX. Successful treatment was considered when fillings did not present with any clinical problems. Unsuccessful treatment was considered when the teeth in which fillings were placed developed clinical signs of acute pulpitis or periodontitis.

Results: One hundred and thirty six teeth with medium-size caries were evaluated. One hundred and twenty four (91.2%) teeth with no clinical problems were recorded. Progression of carious lesion was found in 12 (8.8%) teeth. Out of the 46 teeth treated for caries close to dental pulp, 33 (72%) teeth had no clinical problems, while pulpitis or periodontitis had developed in 13 (28%) teeth.

Conclusion: The success rate of treatment made by GIC materials was 91.2% for the medium-size caries, and 72% for the deep caries close to the pulp.

P26-472

Glass ionomer used as fissure sealant in primary molars

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Background: Clinically, the caries treatment to the toddlers is a task for all dentists. Especially, the deep pits and fissures over primary molars are hard to be brushed properly, and they are prone to caries. Therefore, if we can use a simple technique to prevent the occlusal caries, the dentists, parents, and children can get the win-win-win deal. The resin fissure sealant has been proven to be an effective technique to prevent occlusal caries for permanent dentition. When it comes to the toddlers, the complicated process

of applying the resin sealant, and the cooperative ability of toddlers may make it hard to be done.

Aim: We tried to modify the fissure sealant technique with the glass ionomer cement which is less technique sensitive.

Design: Our study subjects were children who visited the Pediatric Dentistry section in Taipei Veterans General Hospital. Glass ionomer was applied to primary molars without existing permanent molars.

We analyzed the retention rate of glass ionomer and the caries prevalence on these teeth.

Results: Our result showed that the half year retention rate of glass ionomer was 81.7%, and 86.0 for one year. The caries rate was 1.7% in half year follow-up and 0.3% in the one year follow-up.

Conclusions: The result suggested that glass ionomer used as fissure sealant can be a useful technique to prevent the occlusal caries in toddlers.

P26-473

Relationship among dental caries, chronic sinusitis and paranasal sinuses anatomic variations in children using cone beam CT

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Aim: Chronic sinusitis is increasing in the pediatric population. Rhinosinusitis is an especially common problem in the pediatric age group. Previous studies examined the possible relationship between chronic sinusitis and paranasal sinus variations; however no study found a possible relationship with dental caries. Hence, the aim of this study is to investigate the relationship among dental caries, chronic sinusitis and anatomical variations.

Design: Thirty children with and 28 children (7–16 yrs) without sinusitis were enrolled in the study. The paranasal sinus anatomic variations were investigated via coronal and sagittal section CBCT scans. All paranasal sinus variations were classified according to age and sex. The dental caries of all children was diagnosed with clinical and radiologic examinations.

Results: The maxillary sinus was the most commonly involved sinus, followed by the ethmoid, sphenoid, and frontal sinuses. The most common anatomical variations were: Agger nasi cell, Septal deviation, Haller cell, concha bullosa, and Onodi cell. There was statistical significance relation among dental caries, paranasal sinus variations and sinusitis ($P < 0.05$).

Conclusions: Anatomical variations in the paranasal sinuses found to be common in our study group. The children who have chronic sinusitis and paranasal sinus variations may lead to progress of dental caries in children.

P26-474

Gender- and age-based comparison of subjective symptoms of temporomandibular disorders in young patientsH. KARIBE¹, G. GODDARD², K. AOYAGI-NAKA¹, T. KAWAKAMI¹, P. RUDD² & C. MCNEILL²¹Nippon Dental University, Tokyo Japan; ²University of California, San Francisco, CA, USA

Background: Many epidemiological studies in children and adolescents with temporomandibular disorders (TMDs) have been conducted. However, hospital-based comparative studies in TMD patients of different age groups are lacking.

Aim: We compared the subjective symptoms of TMDs—pain intensity and difficulties in activities of daily living (ADL)—in young patients according to gender and age.

Design: This study included 167 TMD patients (mean age, 14.6 years; age range, 6–18 years; girls, 119; boys, 48). Subjective symptoms were assessed using self-reported forms with 5 ratings for pain intensity in the orofacial region and 6 ratings for difficulties in ADL. The patients were divided into group 1 (6 to 12-year-olds [juvenile]), group 2 (13 to 15-year-olds [early adolescent]), and group 3 (16 to 18-year-olds [late adolescent]). Mann–Whitney U-test and Kruskal–Wallis test were used for comparisons.

Results: Gender-related differences in the symptoms among the groups were insignificant, except that group-3 patients experienced headache and neck pain. Pain intensity and tightness in the jaw/face, headache, and neck pain as well as ADL-related difficulties, including prolonged jaw opening, eating soft/hard foods, and sleeping, significantly differed among the groups ($P < 0.01$).

Conclusions: The differences in pain intensity and difficulties in ADL between the 6 to 15-year-old boys and girls with TMDs were insignificant. Late-adolescent patients with TMDs experience greater pain intensity in the orofacial region and greater difficulty in ADL than do early-adolescent and juvenile patients with TMDs.

P26-475

Characteristic of treatment needs of first visit to a paediatric dental clinic in Beijing

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Background: Data on the oral health status and treatment needs of Chinese children are lacking.

Aim: To assess dental treatment needs and oral health status among children under 18-year-old in Beijing and to evaluate their relationship with age and gender.

Design: A number of 3148 children aged 0.8–18 years were selected from patients at their first visit in the Department of Paediatric Dentistry, Peking University School and Hospital of Stomatology, from May 2010 to January 2011. The treatment needs were evaluated and analyzed.

Results: The mean age of these children was 6.23 ± 3.46 , and 52.38% of them were boys. The percentages of treatment need of caries, pulpitis, teeth developmental abnormalities and dental injuries were 35.0%, 32.2%, 11.5% and 6.7% respectively. A percentage of 3.57% (112) children suffered from toothache and needed an emergency dental treatment. In 1602 children younger than 6-year-old, 55.18% (884) were diagnosed as they're having severe early childhood caries. Only 8.92% (281) of the study subjects were found without treatment need.

Conclusions: Systematic implementation of preventive oral care and community-oriented health programs for children, especially pre-school children, are urgently required in China.

P26-476

The impact of oral health education in a community baby programC. PALMA¹, J. RABASSA¹, R. GOMES² & Y. GONZALEZ¹¹Master of Paediatric Dentistry, University of Barcelona, Spain;²Faculty of Dentistry, University of Lisbon, Portugal

Background: Early childhood oral health (ECOH) is an essential issue considering that early childhood caries (ECC) is the most common chronic disease among young children and a public health problem in Catalonia, Spain. As ECC is strongly influenced by the determinants of health, ECOH education must start during early childhood. The community program 'We have a child' offers a weekly support environment for parents of babies younger than 1 year old. A pediatric dentist provided ECOH theoretical and 'hands-on' workshops to all participants.

Aim: (1) To determine the oral health awareness of parents, (2) to evaluate the effectiveness of 'hands-on' ECOH workshops and (3) to investigate what changes in behaviors did parents consider more feasible to incorporate.

Design: During 2010 a total of 12 workshops were held, consisting of: an interactive presentation, a group discussion and 'hands-on' oral hygiene procedure on babies. A questionnaire with essential ECOH issues was completed before and after the workshop by 84 parents. Data were entered for statistical analysis.

Results: The pre-workshop surveys reflect little awareness of ECOH issues amongst parents. The post-workshop questionnaires show a statistically significant increase in ECOH knowledge. Parents considered that avoiding vertical bacterial transmission and oral hygiene procedures were the most feasible ECOH changes they could incorporate in their daily habits.

Conclusions: ECOH workshops provided by a pediatric dentist in a community baby program increased the proportion of ECOH knowledge in participants. Raising awareness of the importance of ECOH is essential to promote healthy habits in early infancy.

P26-477

Control group streptococcus mutans by using xylitol gumM. ACUÑA¹, S. IBARRA¹, A. CARRILLO², A. ZAMUDIO¹ & I. VERDUGO¹¹Paediatric Dentistry Universidad Autónoma de Baja California, Mexico; ²Hospital Infantil de las Californias, Mexico

Background: Chewing gum containing protective substances is effective and have the potential to improve the oral health status.

Aim: To verify the control of Mutans Streptococcus by using chewing gum.

Design: Experimental, prospective, longitudinal study. Participants were divided into two groups, one with chewing gum with xylitol as a group test and one with sugar-free chewing gum as a control group (Trident® with xylitol and Trident White®). The two groups were instructed to chew three pieces of gum a day for 6 months. They took an initial saliva sample and one every 2 months and each was cultured on Mitis Salivarius agar for 72 h.

Results: The test group 94.5% and 80% in the control group showed a reduction in bacteria levels at 6 months. Both groups showed a reduction in Mutans streptococcus levels at 6 months compared with the initial sample.

Conclusions: We conclude that the use of xylitol chewing gum can be an alternative in the control group the levels of Mutans streptococcus.

P26-478

Preventive effect of adhesive tape supplemented with naf on enamel erosion *in vitro*

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Background: Commercially available fluoride varnishes cause rejection because of unpleasant taste and wet consistency in young patients. They are not attached for a long period of time to the tooth surface and they are easily washed away with saliva or foods. Therefore, development of appropriate fluoride delivery system within the oral cavity is necessary.

Aim: The purpose is to evaluate the preventive effect of the biodegradable and biocompatible adhesive tape supplemented with sodium fluoride on the dental erosion *in vitro*.

Design: Sound bovine tooth samples were selected and divided randomly into four groups: group 1, APF gel; group 2, fluoride varnish; and groups 3 and 4, fluoride tape supplemented with 5% NaF in either a methylcellulose or polyvinyl-acetate carrier, respectively. All specimens were submitted in alternate cycles of acid exposure in cola beverage (pH 4.3) and artificial saliva for 6 × 5 min/day over a 5-day period. The hardness was recorded every day and the lesion depth was measured after 5 days.

Results: The micro-hardness of the group 2, 3 and 4 were significantly higher than that of group 1 and the control throughout the experimental period ($P = 0.000$). The enamel surfaces of group 2, 3 and 4 showed significantly higher resistance to mineral loss in terms of the erosion depth ($P = 0.000$) than those of group 1 and the control.

Conclusion: Fluoride adhesive tapes is an effective method of reducing the progression of erosion and is recommendable for young patients.

P26-479

Improving the oral health of Glasgow's inner city children

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Background: The Scottish National Action Plan has seen the employment of human and financial resources to empower our patients with preventative knowledge to reduce dental caries through effective home care. So how much do our patients actually know?

Aim: To assess and improve parent's knowledge of tooth brushing techniques and use of fluoride.

Design: The clinician completed a standardized questionnaire for 50 randomly selected patient's aged 0–7 years old attending with their parent/guardian. Recorded, was: patient age; parental help; duration of brushing; tooth paste quantity; fluoride concentration; where to find fluoride information on packaging; and whether the patient spits out. After 6 months, utilizing SIGN guidelines for

tailoring oral hygiene instruction, the questionnaire was completed for a further 50 randomly selected recall patients.

Results: Pre-intervention data showed 43% of children were supervised during brushing, with 64% of three year olds unsupervised. This did not improve after 6 months. Twelve percent recalled the correct fluoride concentration (worryingly 75% of this group had dental training backgrounds) while 15% identified where to locate such information on the packaging. Both figures increased after the second round data collection to 43% and 50% respectively, falling short of our 60% target. Patients/parents were well informed about, duration, tooth paste quantity and spitting afterward, averaging above the 60% with improvement after 6 months.

Conclusion: Our patients/parents knowledge was lacking, specifically in relation to fluoride. The improvement seen was reassuring and can only help meet the National Action Plan targets. However, other strategies may need to be employed to increase parental help.

P26-480

Prevalence of aggregatibacter actinomycetemcomitans (Aa) serotypes in dental plaque of greek children and their mothers

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Background: The Aa prevalence in dental plaque of periodontally healthy children is about 10%. Aa transmission may occur among family members and especially between mothers and their children. Aa serotype distribution varies with the ethnicity in periodontitis patients.

Aim: To examine the prevalence of Aa serotypes in samples of dental plaque from Greek children and their mothers.

Design: Dental plaque samples were collected from all buccal surfaces of 107 children, 4–13 years old, and 83 mothers. Aa and total facultatively anaerobic bacteria in the samples were determined by culturing on selective and Brucella agar media, respectively. Using PCR with specific primers for 16S rRNA and leukotoxin promoter, Aa detection and identification were accomplished in sample material and isolated colonies.

Results: Aa was detected in 14% of children and 25% of mothers. The median Aa proportion of the facultatively anaerobic flora was 0.09% for both groups. Aa was mainly found in children aged >8 years old. Leukotoxic strains of the JP2 clone were not detected. The serotype a, b, and c were equally distributed in children. In mothers, the serotype distribution was 19%, 38%, 31%, 6% and 6% for a, b, c, e, and f, respectively. Aa was found in only 3 mother/child pairs. Each pair had the same serotype, the serotypes being a, b, and c.

Conclusions: The prevalence of Aa and its serotype distribution pattern in Greek children is similar with those reported for Caucasians. Aa occurrence in dental plaque of children and their mothers infrequently coincides.

P26-481

Evaluation of gingival tissue recovery: after placing a stainless steel crown

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Background: It has been observed that after placing stainless steel crowns the gingival tissue usually swells.

Aim: The aim of this study was to assess the gingival tissue recovery after placing a stainless steel crowns in a shorter period and less painful way for the pediatric patient.

Design: This study was double blind in 40 patients, divided into two groups, 20 treated with 2% chlorhexidine (Perioxidin®) and 20 with saline solution. Four periodontal screenings were performed: the first before the tooth was prepared to receive a stainless steel crown, the second when the crown was cemented the third after 24 h, and the fourth, 1 week after the initial screening.

Results: 5% of patients had 0% efficiency with gingival recovery and 17.5% with 100% efficiency with gingival recovery.

Conclusions: We conclude that the use of chlorhexidine gel 2% aids the recovery of the gingival tissue.

P26-482

The physical properties and histological features of resin infiltrated incipient enamel carious lesions

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Background: The resin infiltration, which blocks the lesion progression by penetrating low viscosity resin into incipient caries, has to be studied further due to its short history in spite of innovative

philosophy. On the other hand the liquid resin which contributes to maximizing penetration might be thought to deteriorate the physical properties of the resin.

Aim: This study evaluated the changes in physical properties, stability and histological features of resin infiltrated incipient carious lesions.

Design: Sixty extracted premolars with incipient caries were selected. After treating twenty teeth with infiltrants at half of lesions and nanoindentation in cross-sectioned specimens, nano-hardness was calculated at infiltrated white spots, non-treated white spots and sound enamel in depth oriented profile. Resin infiltration was done for remaining specimens. For twenty among them all the hard tissues were dissolved and remaining resin tags were observed under FE-SEM and penetration depths were measured. The last twenty specimens were thermocycled and the degree of microleakage was assessed.

Results: The percentage of nanohardness to sound enamel was 64.6% and 24.6% in surface layer and lesion body of white spots respectively. In resin-infiltrated specimens, the percentage was 72.1% to the sound enamel. In observation with FE-SEM, homogeneously infiltrated resin tags showed average length of 433 μm . The evaluation of microleakage revealed the result as follows: no leakage 13, leakage to outer half of lesion 5, to inner half 2.

Conclusions: It is thought that the resin infiltration penetrates deeply and homogeneously, and improves the physical properties of carious enamel with relatively good physical stability.

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P27-483

The effect of rotary systems on the surface properties of root canal walls and adaptation of a root canal filling material in primary teeth: a SEM study

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Background: Studies regarding the usage of rotary systems in primary teeth is insufficient and their effect in primary teeth root canal preparations is not clear.

Aim: The aim of this study was to evaluate the effect of preparations with Mtwo, Hero, Race, Protaper rotary systems and K-Files on the adaptation of filling material, appearance of the root canal walls and smear layer by scanning electron microscope.

Design: Palatal canals of four primary molars in each group were prepared according to the manufacturers' instructions. Ten of 20 samples were filled with Endoflas and these samples were evaluated regarding marginal canal adaptations while the remaining empty samples were assessed with respect to surface properties.

Results: For all groups, filling materials were well adapted to the canal walls. Less smear was observed in the M2 group when compared to other groups, especially in the apical third. Non-instrumented areas were observed in K-File and Protaper groups in the coronal thirds. Irregularities and crater like defects were detected in RaCe group while other groups had more regular surfaces.

Conclusions: Despite irregularities in the canal walls and smear layers observed in some of the groups, root canal adaptation of the filling material did not seem to be affected by the method used. However, further *in-vitro* studies investigating success of rotary systems in primary teeth root canal preparations are needed.

P27-484

MTA and portland cement (PC) apical plugs in pulpless teeth with open apices. Report of four cases

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Introduction: MTA and PC plugs are very good alternatives to conventional treatment with long-term calcium hydroxide dressing, which has been widely advocated in the past to treat teeth with open apices associated with pulp necrosis. This treatment modality seems to be preferable since long-term dressing with calcium hydroxide, is regarded responsible for fracture susceptibility. The aim of this poster is to present the results of the clinical management of four cases of pulpless teeth with open apices.

Case report: Three cases of immature pulpless teeth and one failed, after endodontic therapy and apicectomy were endodontically managed conservatively. Three of these cases were treated with an apical MTA plug and one with a PC plug. To prevent the extrusion of the plug materials, collagen matrix was placed. Radiographs at the beginning and immediately after completion of treatment will be presented, as well as recall radiographs after a follow-up period of at least 6 months. A successful outcome is observed in all four cases, confirmed by radiographic resolution of the original lesion and absence of clinical signs and symptoms.

Comments: Those outcomes are in agreement with others' who mentioned that MTA and PC are quite capable of promoting periapical healing, rendering them a treatment of choice for pulpless teeth with open apices.

P27-485

Single file root canal preparation technique

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Introduction: Major goal of endodontic treatment is the thorough cleaning and shaping of the root canal system. For this purpose nickel-titanium rotary endodontic instruments are commonly used. These files prepare the canals easily, faster than the hand files and lead to more efficient root canal shaping, particularly for curved canals. Unexpected instrument fracture and high cost are considered disadvantages for these files.

A new preparation technique using only one nickel-titanium file in alternative (reciprocating) movement was recently presented (WaveOne, Dentsply Maillefer, Ballaigues, Switzerland). The instrument is pre-sterilized and is designed for single use. A new motor has been also introduced for this type of instrument movement.

Case Reports: Cases with root canal preparations of molars of children by using this new technique will be presented. After the access opening of the pulp chamber, a No 10 stainless steel k-file is used to scout and penetrate the canal and also to help selecting the size the WaveOne file (small #021-0.06, primary #025-0.08 or large #040-0.08). Glide path is necessary to be created prior to preparation. The shaping procedure starts by using plenty of irrigants and chelating agents. The Wave One file is used until the file meets resistance or goes to the working length. It is important to clean the flutes frequently and check for signs of distortion or wear.

Comments: Main advantages of this technique is the simplicity of the protocol, the reduced preparation time (single file, no changing or organizing time) and the absence of risk for cross-contaminations.

P27-486

Characteristics of endodontically treated permanent teeth in Greek teenagersO. PANAGOPOULOU¹, A. LAMPROPOULOS²,
K. KAVVADIA¹ & P. PANOPOULOS²¹*Department of Paediatric Dentistry, Dental School, University of Athens, Greece;* ²*Department of Endodontics, Dental School, University of Athens, Greece***Background:** No data exists on the characteristics of endodontically treated young permanent teeth in Greek teenagers mainly due to lack of surveys concerning the endodontic needs of Greek teenagers.**Aim:** To investigate through a suitable recording sheet, the characteristics of endodontically treated permanent teeth in Greek teenagers.**Design:** The sample of this study consisted of 147 treated teeth in 137 patients, 7 to 18 years old, to be treated endodontically at the postgraduate department of Paediatric Dentistry University of Athens during the period 2002–2007. Data regarding the type of tooth treated the reason for treatment, the pulp condition, the clinical signs and symptoms and the radiographic findings were collected through a detailed recording sheet completed by the residents.**Results:** Most of the teeth requiring endodontic treatment were found in the 10–13 years old. Regarding the tooth type 50% were molars, 6% premolars and 44% incisors. The most common reason for endodontic treatment was deep caries (58% of the teeth) followed by trauma (36%, mostly in incisors). Teeth with non vital pulp were 80% of the sample. Among them edema was present in 24%, fistula in 8%, and mobility in 17% and spontaneous pain in 27% of the teeth. Regarding the radiographic findings, 58% had periapical radiolucency, 4.3% internal resorption while 0.9% had external resorption.**Conclusions:** The most common reason for endodontic treatment was caries, more often in molars, in the 10 to 13 years old group whilst the pulp in most of the teeth was nonvital.

P27-487

Open apex: from past to future

P. NIKOLIS, G. NIKOLOUDAKI & N. P. KEREZOU DIS

*Dental School, University of Athens, Greece***Introduction:** Conventional root canal filling technique relies on the presence of a constriction at the apical level of the canal. Therefore, the absence of the apical constriction due to incomplete root development or extensive apical resorption, presents a challenge. Placement of a root filling in a canal with an open apical foramen

carries the risk of material extrusion which in turn may compromise the outcome of treatment. To avoid extrusion, compaction may be minimized, resulting in inadequate adaptation and seal.

Case report: Through years a variety of treatment options has been described in order to provide a secure obturation at the apical terminus. The aim of this poster is to demonstrate a number of cases presenting immature or resorbed apices managed with the calcium-hydroxide apexification procedure, chloroform and heat-assisted apical printing, MTA plug and revascularization. Advantages and disadvantages of each option are discussed. Procedural details are presented in order to ensure healing potential.**Comments:** In the management of the distorted apical constriction modern treatment procedures, yet not clinically reviewed, intent to overcome the drawbacks of earlier and broadly accepted techniques.

P27-488

Calcified root canals: types, clinical means and methods of treatment

S. CHIOTI & N. KEREZOU DIS

*Dental School, University of Athens, Greece***Introduction:** The calcification of the pulp is a frequent phenomenon observed occasionally during routine radiographic examinations. According to studies the rate of its occurrence varies from 7.5% up to 90%. In an obliterated pulpal lumen, the pulp can be vital, necrotic or degenerated. However, the root canal is never completely blocked, even in cases where it is not visible in a radiograph. The calcification forms are: i) diffuse, where the root canal is clinically presented on the radiographic film as a line, ii) located, where pulp stones are observed and iii) calcific metamorphosis that is commonly observed after traumatic tooth injuries and is characterized by hard tissue deposition.**Case reports:** Clinical incidents will be presented on calcification of the crown and/or the root canal, treated with modern materials and means available by dentists today.**Comments:** In the case of calcified pulp, it is difficult to locate and therefore to perform a proper endodontic treatment of the root canal. The use of special glasses with magnifying lenses, the surgical microscope and the cone beam computed tomography, can play an important role in the acquisition of access. Moreover, the localization of the orifice of the root canal can be facilitated by extending the access opening, and verifying its progression radiographically per stage, taking into account that the root canal usually is found in the centre of traverse cross-section of the root. Another way to locate orifice is the application of dye at the pulp chamber and therefore the illumination of the crown by applying a powerful diagnostic light.

P27-489

Performance of three methods for root canal length determination in human and artificial primary teeth

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Background: The electronic apex locator (EAL) has a better performance in root canal length determination (RCLD) for primary teeth compared to methods such as radiographic (RAD). However, the performance of cone beam computed tomography (CBCT) has not been evaluated yet to obtain the RCLD.

Aim: To evaluate: RAD, EAL 1 (Mini apex locator), EAL 2(Root ZX), CBTC – coronal (C) (iCAT) and CBTC – sagittal (S) (iCAT). The sample consisted in: 30 human and 30 artificial anterior primary teeth (HAPT and AAPT), 21 human and 21 artificial posterior primary teeth (HPPT and APPT). The actual canal length (AL) was measured. The measurement agreements were calculated, using the actual values of the devices, by intraclass correlation coefficient (ICC) and Bland and Altman analyses.

Results: Differences and concordance limits of each method were recorded, respectively: **HAPT** (RAD = -1.20 to -2.23; 0.882; EAL 1 = 1.20 to -0.77; 0.962; EAL 2 = 1.42 to 0.58; 0.945; CBTC-C = 1.89 to -0.82; 0.910; CBTC-S = 2.08 to -0.65; 0.889); **AAPT** (RAD = 0.72 to -2.45; 0.518; EAL 1 = 1.90 to -0.58; 0.644; EAL 2 = 1.86 to -0.99; 0.617; CBTC-C = 3.20 to -0.50; 0.237; CBTC-S = 3.36 to -0.44; 0.297); **HPPT** (RAD = -2.90 to -3.70; 0.685; EAL 1 = 1.54 to -1.19; 0.941; EAL 2 = 1.33 to -1.05; 0.958; CBTC-C = 2.62 to -0.85; 0.828; CBTC-S = 2.70 to -0.80; 0.806); **APPT** (RAD = 1.00 to -4.40; 0.625; EAL 1 = 1.45 to -0.88; 0.959; EAL 2 = 1.64 to -0.85; 0.947; CBTC-C = 2.90 to -0.90; 0.831; CBTC-S = 2.80 to -1.20 0.865).

Conclusion: Both EAL gave the best performance in determining root canal length in all groups.

P27-490

The effect of mineral trioxide aggregate on proliferation and differentiation of pulp cells originating from primary teeth and permanent teeth

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Background: Mineral trioxide aggregate (MTA) has been suggested to induce dentin bridge and hard tissue formation by pulp tissue. There are many studies investigating reaction of pulp cells with MTA, but most of them deal with pulp cells from permanent teeth, not deciduous teeth. Currently, clinical application of MTA on deciduous teeth is increasing, and therefore changes in pulp cells when meet MTA need to be investigated.

Aim: The aim of this study is to compare proliferation and differentiation ability of pulp cells from permanent teeth and deciduous teeth in response to MTA.

Design: Primary culture of pulp tissue was performed using extract method. Pulp cells from permanent teeth and deciduous teeth were seeded in direct contact with MTA block. Proliferation was analyzed using CCK-8 assay kit and cell cycle was analyzed using propidium iodide. Gene expression level related to hard tissue formation was measured using real time RT-PCR at day 1, 2, 4, and 7.

Results: The proliferation rate of pulp cells from deciduous teeth was faster than permanent teeth, and cell cycle analysis revealed higher S/G2 contents in deciduous teeth. Real time RT-PCR revealed greater expression level of alkaline phosphatase, dentin sialoprotein, and dentin morphogenetic protein, and osteocalcin in pulp cells obtained from permanent teeth.

Conclusions: These results indicate that pulp cells from deciduous cells show greater proliferation rate but induction of hard tissue formation is not as active as in permanent teeth when placed on MTA block.

P27-491

Comparison of radiographic success change in pulpomotized primary molars with formocresol, ferric sulfate and mineral trioxide aggregate (MTA)

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Background: Pulpotomy is the most frequent endodontic treatment of primary teeth in children under 6 years old. MTA and ferric sulphate are alternative medicaments to formocresol.

Aim: The aim of this investigation is to compare the radiographic changes in three major methods for pulpotomy in primary teeth: Devitalization, Preservation and Regeneration.

Design: One hundred thirty five primary molars in the children between 3–6 years old, with the treatment plan of pulpotomy were randomly allocated in one of these 3 groups. The patients were recalled and examined radiographically in: 3 months and 12 months post treatment.

Result: By comparison of the first and second radiographic appearances, the samples could be classified in one of the following groups: 1) no pathologic finding in both recalls 2) no pathologic finding in the first but present in the second recall 3) pathologic finding in the first recall that did not change in the second one 4) pathologic finding in the first recall that healed in the second one 5) pathologic finding in the first recall that progressed in the second one. Groups 2 and 5 groups were considered unsuccessful. According to this classification, successful rates of every methods were determined as follows MTA group:74.2% FS group:91.7% TCF group:93.1%

Conclusion: The TCF group showed the best results under the conditions of the present study.

P27-492

Ultramicroscopic observations on the early effects of mineral trioxide aggregate (MTA) in experimental capping situations

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Background: The dentinogenic effects of MTA as capping material in vital pulp therapy have been well recognized. However the mechanism underlying differentiation of odontoblast-like cells in direct contact with the MTA has not been understood.

Aim: The aim of the present study is to characterize the cytological changes 3 and 7 days after exposure of MTA on pulpal cells in capping situations of animal teeth.

Design: Ten premolars from two dogs, 12–15 months of age were mechanically exposed via class V cavities. Light pressure was applied to control haemorrhage. ProRoot MTA (Dentsply Simfra, Paris) was placed at the exposure site and light pressure was applied with a wet cotton pellet. The cavities were restored with amalgam and the pulpal tissue reactions were assessed by transmission electron microscopy after 3 and 7 days.

Results: A thin zone of tissue degeneration including amorphous crystals adjacent to the capping material was seen after 3 days. Cells in the underline zone showed characteristics of fibroblast-like cells. A well-organized zone of crystalline structures was found after 7 days. Spindle or polygonal cells attached to the crystalline structures showed important cytological modifications including rough endoplasmic reticulum, numerous mitochondria and developing Golgi elements between the cell nuclei and the attached cell surface. No polarized matrix has been formed.

Conclusions: Changes implying cytological organization of supranuclear zone in the cells attached onto the MTA-induced crystalline structures seem to mediate induction of odontoblast-like cells.

P27-493

Extensive periapical destruction due to trauma resolved with endodontic therapyA. LAMPROPOULOS², I. VASILOUDIS¹ & K. KAVVADIA¹*¹Department of Paediatric Dentistry, Dental School, University of Athens, Greece; ²Private Practice, Athens, Greece*

Introduction: A 16-year old teenager was referred by an oral surgeon for evaluation of an extensive radiolucency at the periapical area of #21, #22, #23 as seen at the periapical x-rays. Tooth #21 had a prior history of crown fracture five years ago.

Case report: Clinical examination revealed sinus tract at the periapical area between #21 and #22. Pulp vitality testing showed #22 and #23 vital and #21 necrotic. The size, the location and the characteristics of the lesion were determined by CT scan. The lesion extended from the periapical area of #21 to the distal area of #23, displacing the roots of #22 and #23. Endodontic therapy with the interval of Ca(OH)₂ application was initiated on tooth #21. The sinus tract healed 2 weeks later. Radiographic examination at 1½ years showed complete healing of the lesion.

Comment: Conservative approach with endodontic treatment alone may be successful without the need for surgical intervention.

P27-494

Regenerative endodontics –a novel approach to restore immature teeth

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Introduction: The purpose of this case report is to present a case with necrotic infected pulp of an immature tooth undergoing revascularization.

Case report: An 8 year old child presented with an abscess with open apex of an incisor. After disinfecting the canals with topical antibiotic paste revascularization was induced into canal space. One and half year follow up was done with successful root and development and maturation. A positive result with pulp vitality was found at subsequent visits.

Comments: The blood clot created in the canal acts as a matrix for the growth of new tissues hence continued root end development was seen as the vascular endothelial cells are critical for dentin regeneration. There is an intimate association of the neural elements with vascular supply of dental pulp, suggesting interplay of neural and vascular elements and involvement in pulp homeostasis.

P27-495

Host factors and traumatic dental injuries in children: the role of aggressive behaviour

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Background: Traumatic dental injuries (TDI) are widespread and represent a serious dental public health problem in childhood. The causes of dental injuries are complex and a range of psychosocial factors could be associated with increased risk for injury. Despite its importance, very few studies have analysed association of repeated injuries and child's aggressiveness.

Aim: The aim of this study was to examine the association between aggression and repeated dental injuries among a cohort of children aged 9 – 17 years.

Design: The aggressive behaviour was assessed in 114 patients (80 males and 34 females) with TDI. The group consisted of children with a single injury (SI) and with repeated injuries (RI). The Overt Aggression Scale (OAS) was used to assess children's aggression and to obtain information about four types of aggressive behaviour (verbal aggression and aggression against objects, self, and others).

Results: Males with RI displayed significantly higher aggressive behaviour than males with SI ($\chi^2 = 7.36$; $P = 0.006$). Aggressive behaviour in males with RI was significantly higher in age group 12–17 years. Males aged 12–17 years have 3.6 times higher risk for injury repeating than males with SI (OR = 3.626; 95% CI = 1.421–9.258). Females with RI in both age groups showed similar level of aggressive behaviour.

Conclusion: Aggressive behaviour and increased score of aggression against others are frequent symptoms of male patients with RI. Referral of aggressive children to the child psychiatrist could contribute to the improvement of child's behaviour and decrease a risk for further injuries.

P27-496

Orthodontic extrusion of intruded upper central incisors and endodontic approach: case report

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Introduction: This case report describes the management of severe intrusion and avulsion.

Case report: After an accidental trauma, a 7-year-old boy was referred to the I.U. Faculty of Dentistry, Department of Pediatric Dentistry Clinic. Clinical and radiographical evaluation showed the avulsion of upper left lateral incisor and severe intrusion of upper central incisors. The treatment plan included orthodontic extrusion, apexification, composite restoration and balancing extraction. The progression of re-eruption was followed at 3 months after trauma and at the end of spontaneous re-eruption, 0.016" NiTi arch wire was applied for levelling. Necrotic immature upper central incisors treated with calcium hydroxide apexification. Ten months after the beginning of apexification treatment, it was detected that there were no calcified barrier formation in the apices and MTA was then used as apical plug material for the endodontic treatment of the teeth. The space after the avulsion of upper left lateral incisor was closed by the mesialization of upper left posterior teeth and upper right permanent first premolar was extracted aiming balancing and class I occlusion of upper right permanent canine.

Conclusion: After 36 months follow up period, the teeth and surrounding tissues have appeared normal in all respects. Clinical follow up period continues and compensation extractions of lower permanent first premolars is planned aiming the treatment of malocclusion.

P27-497

Replantation of two avulsed permanent incisors after different storage media: a 3-year follow up

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Introduction: Avulsion of teeth following traumatic injuries is relatively infrequent, ranging from 0.5 to 3%. Immediate tooth replantation is the treatment of choice, but it is not always performed. An appropriate storage medium must be used to maintain periodontal ligament (PDL) cell viability when it is impossible to replant immediately. The purpose of this report is to describe the case of replantation of two permanent teeth after avulsion by traumatic sport injury in a nineteen year old female patient.

Case report: The case describes a 3-year follow-up of the treatment of avulsed maxillary right central incisor (11) and lateral incisor (12) teeth. The teeth were replanted after an extra-oral time of 150 min (extra-oral dry time 40 min approximately). The avulsed teeth were kept in alcohol for 40 min and then changed into cold milk until replantation. Before replantation, teeth were soaked in Doxycycline for 5 min and NaF for 5 min. A wire-resin splint was made and root canal procedure with calcium hydroxide dressing was initiated eight days after the replantation. Post operative indications included antibiotic therapy (Doxycycline 500 mg), analgesic anti-inflammatory, oral hygiene with chlorhexidine 0.12% oral rinse and soft diet. Definite endodontic treatment was made 5 months after Ca(OH)₂ dressing for 11, and 7 months after for 12. At present, radiographic evaluation showed only slight root resorption and intact PDL.

Conclusion: This case demonstrates that even though inappropriate storage media were used, following the IATD guidelines, replanted teeth may have a favorable outcome.

P27-498

Multidisciplinary approach for a complicated crown-root fracture: a case report

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Introduction: The aim of this presentation is to report a case that shows the multidisciplinary approach required to successfully manage the rehabilitation of a maxillary right central incisor with an oblique crown-root fracture.

Case report: A 13 year old boy who suffered a complicated crown root fracture of maxillary right central incisor was referred to our clinic. Clinical and radiological examinations revealed an oblique fracture line which was extending labially towards the coronal third of the root. The tooth was tender and the fractured coronal segment was mobile. Removal of coronal fragment and disarticulation of radicular fragment was followed by intentional replantation with 180° rotation. Stabilization of the root in its new position was achieved with interdental sutures on both sides of the extruded root and a surgical dressing. After the surgical procedure the pulp was extirpated and the root canal was filled with calcium hydroxide. Antibiotic therapy was prescribed for 10 days and the patient was motivated to maintain oral hygiene. The sutures and surgical dressing were removed after 1 week and a semi-flexible splint was placed for 10 days. Before root canal obturation with gutta-percha, a calcium hydroxide dressing was maintained for 9 months. Composite restoration was performed after the completion of the root canal treatment and gingivectomy.

Comment: It could be suggested that the intentional replantation with 180°-rotation with a multidisciplinary cooperation allowed for a more conservative approach with a clinical success of one year without resorption in this case.

P27-499

Foreign objects in the lower lip after traumatic dental injury: two case reports

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Introduction: Dental trauma requires a special consideration when foreign objects or dental fractures accompany soft-tissue lacerations.

Case report: The present clinical report describes two cases in which dental fragments were embedded into the lower lip soft tissue. Radiographs confirmed the presence of these fragments which were surgically removed under a local anaesthesia.

Comments: The thorough clinical examination is of utmost importance when soft tissue wounds have been occurred in association with missing teeth or the presence of foreign objects. Also, in such cases, the necessity for taking routine facial soft tissue radiographs before starting treatment is emphasized. Early diagnosis and surgical removal of these fragments could prevent undesirable foreign body reaction and scarring.

P27-500

The influence of an additional crown fracture on the risk of pulp necrosis for teeth with a luxation injuryE. LAURIDSEN¹, N. HERMANN¹, T. GERDS² & J. O. ANDREASEN³¹*Department of Pediatric Dentistry and Clinical Genetics, School Of Dentistry, University of Copenhagen, Denmark;* ²*Department of Biostatistics, University Of Copenhagen, Denmark;* ³*Center of Rare Oral Diseases, Copenhagen University Hospital, Rigshospitalet, Denmark***Background:** Healthy teeth with a crown fracture injury without pulp exposure have a very low risk of pulp necrosis (PN). If however, the blood and nerve supply to the pulp is compromised due to a luxation injury, the fracture may act as a pathway for bacteria entering the pulp cavity, causing infection.**Aim:** To analyze the influence of crown fractures without pulp exposure on permanent incisors with concussion, subluxation, extrusion and lateral luxation in relation to pulp necrosis.**Design:** The material included 1137 permanent incisors with luxation injury, 396 of these teeth had an additional crown fracture without pulp exposure. Examination, treatment and follow-up was performed according to standardized protocol. Statistics: The risk of PN was analyzed by the Kaplan–Meier method, the log-rank test, Cox regression analysis. Level of significance 5%. Each luxation type was analyzed separately. Variables included in the regression analysis: Root development, crown fracture, age, gender, mobility, electric pulp test at time of injury.**Results:** Crown fractures only had a minor influence on the risk of PN for teeth with concussion. The risk of PN was significantly increased for teeth with subluxation and lateral luxation (immature and mature root development) in case of an additional crown fracture.**Conclusion:** Teeth with crown fracture and additional subluxation, extrusion (non-sig.) or lateral luxation had a moderate to high risk of developing PN. Attempts should therefore be made to seal off possible ways of entry of bacteria through the crown into the pulp of the tooth.

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P28-501

Quantitative analysis of the relationship between periodontopathogens and clinical indexes in adolescents

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Background: Gingivitis is the most common chronic infection in adolescents, some gingivitis gradually progresses to periodontitis. It is generally accepted that *Porphyromonas gingivalis* (*P.gingivalis*), *Actinobacillus actinomycetemcomitans* (*A. actinomycetemcomitans*), *Prevotella intermedia* (*P.intermedia*), *Tannerella forsythensis* (*T.forsythensis*) and *Fusobacterium nucleatum* (*F.nucleatum*) are closely associated with the onset and severity of adult periodontal disease. However, little is known regarding the colonization by these microorganisms in adolescents.

Aim: To analyze the relationship between these periodontopathogens and periodontal clinical indexes in adolescents.

Design: 77 subgingival plaque samples from thirty-five 12 to 18-year-old children were collected. The clinical indexes of plaque index (PI), gingival index (GI), sulcus bleeding index (SBI) and probe depth (PD) were assessed. Then DNA was extracted from the pooled subgingival plaque. The copy numbers of *P.gingivalis*, *A. actinomycetemcomitans*, *P.intermedia*, *T.forsythensis* and *F.nucleatum* were quantified by SYBR GREEN real-time PCR. The spearman rank correlation was used for analysis of the relationships between clinical indexes and bacteria copies.

Results: The Spearman correlation coefficient for *P.gingivalis* and PI,GI,SBI,PD are 0.375 ($P < 0.01$), 0.484 ($P < 0.01$), 0.554 ($P < 0.01$) and 0.566 ($P < 0.01$) respectively; for *P.intermedia* are 0.413 ($P < 0.01$), 0.481 ($P < 0.01$), 0.556 ($P < 0.01$) and 0.545 ($P < 0.01$); for *F.nucleatum* are 0.363 ($P < 0.01$), 0.387 ($P < 0.01$), 0.483 ($P < 0.01$) and 0.381 ($P < 0.01$); for *T.forsythensis* are 0.383 ($P < 0.01$), 0.453 ($P < 0.01$), 0.533 ($P < 0.01$) and 0.468 ($P < 0.01$); for *A. actinomycetemcomitans* are 0.399 ($P < 0.01$), 0.332 ($P < 0.01$), 0.368 ($P < 0.01$) and 0.229 ($P < 0.05$).

Conclusions: There were significant correlations between the copy number of Periodontopathogens and the severity of periodontal inflammation in adolescents.

P28-502

Distribution of periodontopathic bacterial species in mothers who experienced preterm low birthweight delivery

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Background: Recently, an association between periodontitis and preterm low birth weight (PLBW) delivery has been reported. However, few studies have investigated the prevalence of periodontopathic bacterial species in mothers who experienced PLBW delivery.

Aim: The aim of the present study was to investigate the distribution of periodontopathic bacterial species in mothers who experienced PLBW delivery in comparison with that in mothers who did not.

Design: Fourteen mothers who experienced preterm birth (PB; less than 37 weeks gestational age), low birth weight (LBW; less than 2500 g), or PLBW (PB and LBW) delivery were analyzed. As a control group, 32 age-matched mothers who did not experience PB/LBW/PLBW were also analyzed. Bacterial DNA was extracted from saliva specimens obtained from the subjects and PCR was performed using species-specific sets of primers for *Porphyromonas gingivalis*, *Prevotella intermedia*, *Treponema denticola*, *Aggregatibacter actinomycetemcomitans*, *Tannerella forsythia*, and *Campylobacter rectus*.

Results: The total numbers of periodontopathic bacterial species were significantly greater in the PB/LBW/PLBW group than the control group. In addition, the positive rates of several periodontopathic bacterial species were significantly higher in the PB/LBW/PLBW group. Among the subjects in the PB/LBW/PLBW group, there was a tendency for more periodontal species to be identified in mothers with PLBW as compared to those with PB and LBW.

Conclusions: The distribution of periodontopathic bacterial species in mothers who experienced PLBW was different from that in mothers who did not, suggesting that the presence of periodontopathic bacteria might influence PLBW.

P28-503**Clinical & microbial findings in adolescences with aggressive periodontitis**

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Background: Aggressive periodontitis is a destructive inflammatory disease that affects mainly the periodontal ligament and alveolar bone. The disease is rapidly progressive and characterized by an early age of clinical manifestation and a tendency to aggregate in families.

Aim: The aim of this study was to investigate the clinical and microbial profile in adolescences with aggressive periodontitis.

Methods: Six adolescences, attending University of Science and Technology Clinic in Sudan, aged 13–18 years, were diagnosed with aggressive periodontitis (AgP) based on the presence of pocket depth (PD) and clinical attachment loss (CAL) ≥ 5 mm associated with bleeding on probing (BOP) in at least one incisor and one first molar. Plaque samples were collected with a curette from the subgingival area of the molar or premolar teeth. The plaque samples were analysed using Human Oral Microbe Identification Microarrays. The results were confirmed by RT-PCR using Ingene kits.

Results: The number of sites per patient with PD ≥ 6 mm range between 3 and 37 (Mean = 19.5, SD = 12.9). More than half of the sites per patient presented with BOP. Four patients have lost one or more of the incisors and one patient lost 2 molars additionally. Bacterial species including *Campylobacter concisus* and *rectus* (ot575_748_X36), *Parvimonas micra* (ot111_L97 and ot111_V05), *Eubacterium*[11][G-7] *yurii*_ot377_W84, *Streptococcus* Cluster II/III (ot071_755_758_Q59, and ot755_758_767_768_Q65), *Fusobacterium nucleatum* ss *nucleatum* and *animalis*_ot420_698_AE01 were detected in all patients. *Aggregatibacter actinomycetemcomitans* was detected only in four patients.

Conclusion: The results of this study showed that the classical periodontal pathogens are not present in all patients suggesting a diverse microbial profile in aggressive periodontitis.

P28-504**Management of impacted maxillary canines: surgical exposure in adolescents**

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Introduction: Maxillary impacted canines affect 0.8%–2.8% of the population. Canine impaction is usually retrieved palatally (85%) rather than buccally (15%). In case of palatal impaction there are two main treatment alternatives regarding their surgical exposure: the open and the closed eruption technique. Both can be followed or not by orthodontic traction. In the open eruption technique a punch of the overlying palatal mucosa is removed and if necessary osseous resection is applied to uncover the canine's crown. In the

closed eruption technique, a full thickness mucoperiosteal palatal flap is elevated and bone is removed in order to uncover the crown of the impacted canine. The palatal flap is then sutured back into its initial position with the orthodontic ligature extending through the wound margin, or through an incision made at the palatal flap. If the impacted canine is buccally, a labial approach is used combined with periodontal plastic surgery to ensure the presence of keratinized tissue at the cemento-enamel junction.

Case report: A case series of three pediatric patients referred to the Department of Periodontology, University of Athens, for surgical exposure of impacted canines is presented. The different surgical techniques are described along with their advantages and disadvantages. The criteria for the selection of each approach are explained.

Comments: All techniques were successful. Main factors that affect the clinician's surgical choice are related to the position of the canine and the preservation or the need for displacement of keratinized tissue around the exposed canine.

P28-505**Treatment management of gingival overgrowth**

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Introduction: Overgrowth of gingiva is a significant side effect, which may be of genetic origin or related to drugs intake such as anticonvulsant, immunosuppressant medication and calcium channel blocking agents. It appears that plaque accumulation and inflammation affects the severity of these lesions. The clinical appearance of such lesions has a higher prevalence in younger patients, begins usually from the papilla and it is not associated with attachment loss.

Case report: Three patients were referred to the Department of Periodontology for periodontal therapy. The first patient was mentally retarded, was diagnosed with epilepsy when he was 6 months old and received two anticonvulsant medications every day, for the last twelve years. The second patient, also mentally retarded was under orthodontic treatment. The third patient was diagnosed with Cleidocranial dysplasia. The clinical examination depicted gingival overgrowth, high plaque and bleeding scores and poor oral health. Initial periodontal therapy was performed and oral hygiene instructions were given to all patients and parents. Resolution of inflammation and improvement in all clinical parameters, were observed in all patients. Additionally, crown lengthening was performed in the third patient by means of gingivectomy. Reexamination followed every 6 weeks during periodontal maintenance program.

Comments: It can be underlined that resolution of inflammation by means of initial and surgical periodontal therapy, as well as maintenance of an optimum oral hygiene level is crucial in reduction of gingival overgrowth. Lasers application is an alternative therapeutic method currently used in the treatment of such lesions.

P28-506

Rehabilitation of a maxillary central incisor with a socket preservation technique and a resin-bonded bridge in a pediatric patient

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Introduction: In a pediatric patient tooth loss is usually a result of trauma. The upper central incisors are the most often affected teeth. Subsequent lack of hard and soft tissue is sometimes significant and may jeopardize the rehabilitation of the missing tooth. The aim of this presentation is to demonstrate a socket preservation technique for soft tissue maintenance and hard tissue augmentation, using a pedicle palatal connective tissue graft, in an adolescent patient.

Case report: A 14 year old healthy patient was referred to the Department of Periodontics with a fractured and discolored maxillary right central incisor. Clinical and radiographic examination depicted an almost complete lack of the buccal wall of the socket. Simultaneously with tooth extraction, a socket preservation technique was performed. The defect was filled with xenograft and was covered with a resorbable collagen membrane. On top of the membrane, a pedicle rotated palatal connective tissue graft was positioned. A resin-bonded 'Rochette-type' bridge was fabricated for the replacement of the extracted central incisor, until the completion of skeletal development and the final restoration to be made. Despite the initial lack of hard and soft tissue, the final clinical result, 12 months postoperatively, was very satisfactory with an acceptable contour of the tissues at the treated site and an esthetically acceptable restoration.

Comments: Socket preservation techniques can be applied in pediatric patients. This will prevent hard and soft tissue deficiency which will compromise the future restoration of the area. Resin-bonded bridges can be used as long-term provisional restorations.

P28-507

Assessment of periodontal treatment in generalized aggressive periodontitis. Case report of twin young girls' follow up of 5 years

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Introduction: Generalized aggressive periodontitis appears in puberty and is characterized by clinical attachment loss ≥ 4 mm in at least 8 teeth. Late diagnosis of the disease may lead to dental loss at an early age.

Case report: A girl of 17 years old, with mobility and movement of her front teeth was referred for periodontal assessment because during her orthodontic treatment the results were not the ones that were expected and her dental condition was deteriorating. The patient had free medical history. After thorough clinical and radiological examination she was diagnosed with generalized aggressive periodontitis. It was proposed to the twin sister to undergo a thorough dental examination. The twin sister was also

diagnosed with generalized aggressive periodontitis with the same distribution of the periodontal lesions in the same teeth surfaces but different severity. Non surgical periodontal treatment in combination with antibiotics was used for both cases. The sisters were re-examined every 3 months and treated accordingly to their needs every time. In the follow up appointment there were no clinical findings to show any relapse and the oral hygiene procedures were very effective. Five years later a second set of full mouth periapical x-rays were taken and were compared to the initial set of x-rays with the help of Emago program and digital subtraction radiography. In both sisters, an important degree of bone regeneration was apparent in most areas where periodontal lesions previously existed and there were many similarities in the distribution of the surfaces where it was evident.

Comments: The contribution of follow up appointments in combination with supportive therapy is a predominant factor in the maintenance of the periodontal therapy especially in difficult conditions as the generalized aggressive periodontitis.

P28-508

The carrier status of fungal flora in ENT-pathology children

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Background: In the past decades there has been a significant increase in fungal diseases in children. Dominant agents of mycotic diseases are yeast like fungi of the genus *Candida*. The most frequent causative agent of fungal infections in children is *Candida albicans*. There is a high incidence of fungal carrier state among healthy individuals. Knowledge of the mechanisms that ensure long-term carriage of *Candida* are still insufficient. At the same time, the source of infection could be not only sick patients but also carriers of fungi of the genus *Candida* (without marked clinical signs of disease).

Aim: The aim of our work was to evaluate the carriage of fungal flora in children with and without marked clinical symptoms of fungal infection.

Design: Under our observation were 80 children with different ENT-pathologies (acute sinusitis, adenoiditis, otitis media) aged from 3 to 14 years. All children were divided into two groups: first group with and second group without clinical signs of fungal infection.

All the children underwent clinical, ENT and mycological examination (material from the oral mucosa).

Results: Fungi of genus *Candida* were cultured in both groups of patients (in 100% and in 16% accordingly). In the 1st group were found *Candida albicans* (70%), parapsilosis (10%) and non-*albicans* in 20%. In the 2nd group - *Candida albicans* was found in all cases.

Conclusions: Thus it is clear that fungi *Candida* may be present in the mucous membranes without causing the development of clinical manifestations. Conducting mycological research revealed children carriage of fungal flora and served as the basis for revising the treatment plan. The mycological examination is necessary especially in case of persistent or recurrent upper airway infections.

P28-509

Antimicrobial activity of extracts from *S. Rebaudiana* against cariogenic microorganismsF. GAMBOA¹ & M. CHAVES²¹Javeriana University, Department of Microbiology and Dental Research Center, Bogotá, Colombia; ²Javeriana University, Dental Research Center, Bogotá, Colombia

Background: Dental caries is a pathological, infectious, localized process that leads to the destruction of dental hard tissue. The main goal of research into medicinal plants is the search for compounds having antimicrobial activity that could be used to control or prevent infectious diseases. *Stevia rebaudiana* Bertoni is a mayor source of high potency sweetener for the growing natural food market.

Aim: To evaluate the antimicrobial activity of extracts obtained from *S. rebaudiana* against bacterial species of importance in dental caries.

Design: Leaves of *S. rebaudiana* were powered in a knife mill and stored. The plant material was extracted with ethanol, chloroform and hexane. The antimicrobial activity of the extracts was evaluated against *S. mutans* ATCC 25175, *S. mutans* ATCC 31989, *S. sobrinus*, *S. salivarius* NCTC 8606, *L. acidophilus* 903 ATCC 4365, *L. plantarum* and *L. casei* according to the well diffusion method. After incubation, the zones of inhibition produced by the extracts were determined.

Results: With differences in the halos of inhibition, since a concentration of 50 mg/ml, hexane extract presented activity against all microorganisms tested. Only from 100 mg/ml the chloroform extract showed antimicrobial activity against microorganisms. Of all the three extracts tested, the ethanol extract showed the lowest inhibitory activity and in some cases was zero.

Conclusions: The antibacterial activity of hexane extract of *S. rebaudiana* was higher than that of the other extracts. The hexane extract of *S. rebaudiana* may become a promising source for finding new antimicrobial agents against microorganisms of importance in dental caries.

P28-510

Distraction osteogenesis in a patient with von Willebrand factor deficiency: case reportN. THEOLOGIE-LYGIDAKIS¹, C. MATSIOULA², S. MAMALI², H. PLATOKOUKI³ & I. IATROU¹¹University Department of Oral and Maxillofacial Surgery, Dental School, at 'P & A Kyriakou' Children's Hospital, Athens, Greece;²Dental School, University of Athens, Greece; ³Haemophilia Centre/Haemostasis Unit, 'Aghia Sophia' Children's Hospital, Athens, Greece

Introduction: von Willebrand's disease (vWD) is an autosomally inherited bleeding disorder caused by a deficiency or abnormality of von Willebrand factor (vWf), a critical component of haemostasis. There are three major subtypes of VWD: partial quantitative vWf deficiency (type 1), qualitative vWf deficiency (type 2) and almost complete vWf deficiency (type 3).

Aim: To present a case of a child with von Willebrand factor deficiency, who underwent an operation to treat hemifacial microsomia.

Case report: A 5 year old boy with left hemifacial hypoplasia was scheduled for mandibular osteotomy and distraction osteogenesis. During pre-operative assessment a previously undiagnosed mild deficiency of vWF (Rcof: 44%, vWF Ag: 56%, n.v. 50–150%) was revealed and the patient was referred for evaluation. After a waiting period of 2 months to exclude temporary acquired deficiency, blood tests were repeated and vWD was confirmed. The pre-operative correction of haemostatic defect was regulated through subcutaneously administering desmopressin (1-deamino-8-D-arginine vasopressin, DDAVP), a synthetic analog of vasopressin, prior and 30 h after surgery under repetitive blood tests. The patient was successfully operated on without any complications during and after surgery. A fluid restriction and continuous evaluation due to DDAVP administration was required to avoid fluid retention and hyponatremia.

Comments: The peri-operative management of patients with von Willebrand's disease with non plasma derived products in order to undergo maxillofacial surgery and generally, a dental therapy is crucial in order to decrease the bleeding tendency during or after these procedures.

P28-511

Oral rehabilitation of a child with cystic fibrosis: Case report

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Introduction: Cystic Fibrosis (CF) is an autosomal inherited disease caused by mutation on chromosome 7. CF phenotype includes chronic progressive pulmonary disease, pancreatic insufficiency and reduced fertility. Frequent episodes of inflammation and daily intake of antibiotics from infancy result in hypomineralization of the teeth. Increased carbohydrate intake in addition to the presence of mucous saliva increase the caries risk of those patients.

Case report: A 10 year old boy with CF was referred to the graduate clinic of paediatric dentistry at University of Athens for dental treatment. The patient was non cooperative due to multiple surgeries and medical visits. The main clinical findings were poor oral hygiene, hypomineralization of all permanent teeth along with multiple carious lesions with pulp involvement. The treatment planning included an individualized preventive program including oral hygiene, systemic and topical fluoride application and use of chewing gum to increase saliva secretion. Since the dietary analysis revealed frequent consumption of sticky carbohydrates less cariogenic food was recommended. Oral rehabilitation included endodontic treatment, extractions and restorations with composite resins and stainless steel crowns.

Conclusion: CF is a serious chronic disorder appearing in children with oral manifestations including teeth hypomineralization and high caries incidents. Consultations from the first year of life and dental care is necessary to prevent caries and other dental complications.

P28-512

Effects of cytotoxic chemotherapy administered in early childhood on permanent teeth development

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Background: Cytotoxic chemotherapy can have an early, usually reversible or long term, mostly irreversible adverse effect on dental status. It is observed that children treated with chemotherapy have disturbed dental development, caused by direct effect of the cytotoxic drug on the odontoblasts or result from early oral complications of chemotherapy.

Aim: To evaluate disturbances in permanent teeth development in patients treated with chemotherapy during early childhood.

Design: Twenty two patients aged 8–18 yrs (median-) treated with multidrug chemotherapy before age of 7 yrs (median-) were the subject of the study. Their primary diagnosis was; soft tissue sarcoma, neuroblastoma, Wilms tumor, histiocytosis, Hodgkin and non-Hodgkin lymphoma. Clinical and radiological (panoramic radiographs) evaluation was performed. Disturbances in teeth development (number, size, shape) and enamel defects were assessed. Type of cytostatics, duration of treatment and patients age at the time of treatment were analyzed.

Results: Discoloration and enamel hypoplasia were the most frequent and observed in 11 pts, hypodontia – 10 pts, microdontia- 6 pts and disturbed root development – 2 pts.

Type of disturbances correlated with developmental phase of the tooth during treatment. Hypodontia and/or microdontia were observed in 11 children of which six were treated with Vincristine given in combination with different cytotoxic drugs like cyclophosphamide, dacarbazine, doxorubicin.

Conclusions: Children with malignant diseases treated with cytotoxic drugs are at risk for developing dental defects.

P28-513

Caries and periodontal disease in children with cerebral palsy according to the socioeconomic status of the educational centre they attend

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Background: Children and adolescents with cerebral palsy (CP) spend most of the day at their educational centres. The oral health care practices and policies in each centre will vary depending on the socioeconomic status (SES) and resources available.

Aim: To compare caries, periodontal disease and oral hygiene indexes of children attending educational centres with different types of funding.

Method: A total of 59 children diagnosed having CP, aged 2 to 19 years, attending three different educational centres were exam-

ined by a qualified dentist under standardized conditions. Written informed consent was obtained. Prevalence of caries free children, caries index (DMFT/dmft), presence/absence of gingivitis and Greene Vermillion oral hygiene simplified Index (OHI-S) were assessed. One centre (Fundación Alter Ego) was classified as high socioeconomic status (SES) and two centres (Colegio Amapolas and Colegio Cedrosdel Líbano) were classified as low SES.

Results: There was a significant difference in the prevalence of caries free children and the DMFT/dmft scores when comparing children from high SES ($n = 30$, 66.7% caries free, DMFT:1.3, dmft:0) to low SES ($n = 29$, 31.0% caries free, DMFT:2.7, dmft:0.5, $P = 0.007$, $P = 0.001$, $P = 0.000$). Gingivitis was diagnosed in 76.6% of the group of high SES and 79.3% in low SES. The OHI-S obtained in the high SES was 2.2 and 2.3 in the low SES. There was no difference in the prevalence of gingivitis or OHI among both groups.

Conclusions: Children attending high SES educational centres had less caries than those from low SES. The prevalence of gingivitis and OHI-S were similar.

P28-514

Multidisciplinary treatment for optimal esthetics in a pediatric patient with cleft palatal-lip

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Introduction: Desirable tooth morphology and gingival margin symmetry are prerequisites to an esthetic smile. This is a presentation of a pediatric patient with cleft palate-lip, who underwent gingivectomy/gingivoplasty, followed by conservative direct restorations with composite resin, to improve the esthetic appearance.

Case report: The clinical case is about a 13-year old boy with cleft palate-lip and considerable esthetic problem in the smile, as a result of gingival asymmetry and tooth form discrepancies. In order to achieve an accurate position of the gingival level, a transparent surgical tray, prepared from the diagnostic wax-up, was used during the surgery. First, an apically positioned flap with osseous resective surgery was applied, to correct the gingival asymmetry at the maxillary right incisor and canine. Nd: YAG laser was additionally used for optimal gingival contours and final tissue level refinement. Three weeks later, the central incisor and the canine were restored directly using composite resin in order to change their shape, decrease the diastema between them and achieve a favorable symmetry in the esthetic zone.

Comments: Multidisciplinary treatment planning is essential in the proper management of esthetic rehabilitation. The contribution of laser Nd: YAG, in addition to conventional periodontal surgery, was significant in improving the esthetic result. Additionally, laser eliminated the need for an additional refining surgery at a second time, making it a friendly procedure for the pediatric patient. Direct adhesive esthetic restorations are the treatment of choice when possible for pediatric patients, since they are conservative and minimally invasive.

P28-515

Complete dentures for children with anodontia

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Introduction: Complete edentulism constitutes a severe impairment for children, since it hinders proper nutrition and speech development, causes a significant aesthetic handicap and jeopardizes the psychosocial maturation. Complete dentures, constructed at the youngest possible age, effectively alleviate the consequences of the lack of teeth.

Case report: The intraoral characteristics, construction procedure and follow-up of complete dentures fabricated for two 5-year old boys with mandibular anodontia associated with hypohidrotic ectodermal dysplasia are presented. The small size of the oral structures and the underdeveloped residual ridge provided a restricted support area for the prosthesis. The reduced saliva production complicated the denture construction and function. The children's needs, as well as their tolerance, modulated the planning and execution of the treatment. Simple procedures, short sessions and careful material selection were applied and the treatment steps were carried out as painlessly and comfortably as possible. The patients' willing cooperation was considered necessary for the execution of the construction steps, for effective adaptation and constant use of the prosthesis and for the establishment of the long-term follow-up. The great adaptation potential of the children and the easiness of corrections contributed greatly to the successful outcome of the prosthodontic treatment.

Comments: The edentulous children are differentiated from their adult counterparts by the young age and the cause for the lack of teeth. The construction of complete dentures for children with anodontia follows the standard prosthodontic protocol, modified according to the special characteristics, to address the needs of this unique group of patients.

P28-516

Panoramic x-ray guides diagnosis in a case of mild hypohidrotic ectodermal dysplasia (HED) presenting with feverE. PAPADAKIS¹, M. AVLONITOU², M. DEMONAKOU³ & S. SAPOUNAS²*¹Dentistry School of Athens, Greece; ²2nd Medical Department, Sismanoglio Hospital, Athens, Greece; ³Department of Pathology, Sismanoglio Hospital, Athens, Greece*

Introduction: Hypohidrotic ectodermal dysplasia (HED) represents a rare genetic syndrome characterized by abnormal development of ectodermal appendages, including hair, teeth, nails, sweat and sebaceous glands. Absence of sweat glands is associated with hyperthermia episodes. Teeth involvement is variable, expressed by complete or partial congenital absence of primary and permanent teeth, abnormal dental size and appearance and late than average teeth eruption. In mild forms of the disorder clinical diagnosis may be difficult.

Case report: We present the case of a female adolescent of 15 years of age who was admitted to hospital because of frequent episodes

of high fever over more than one year. The girl had a normal appearance and physical activity and she attended school regularly. She had a negative medical history. Physical examination revealed nothing of clinical significance and routine laboratory investigation, including complete blood count, ESR, acute phase proteins and biochemistry, was within normal limits, indicating a situation of non-inflammatory origin. Panoramic x-rays showed normal in number and shape appearance of her teeth, but there was noticed a delay in the eruption of the permanent upper and lower premolars, since regularly they are expected to be fully erupted between 10 – 12 years of age. Skin biopsy from her left palm confirmed HED diagnosis.

Comments: Normal inflammation markers in FUO evaluation make hypohidrotic ectodermal dysplasia a possible diagnosis, between other non-inflammatory causes. Odontological evaluation of the oral cavity and the panoramic radiographs might provide information in favor of HED, even when clinical signs are not distinguishable.

P28-517

Orthodontic treatment need of Sotos syndrome. A case reportI. TENTOLOURI¹, I. LYROS², E. BOVALI³, I. BITSANIS² & A. TSOLAKIS²*¹Dental School, University of Athens, Greece; ²Department of Orthodontics, School of Dentistry, National and Kapodistrian University of Athens, Greece; ³Department of Orthodontics, School of Dentistry, University of Geneva, Switzerland*

Introduction: Sotos syndrome, previously known as cerebral gigantism, was initially described in 1964 by Juan Sotos and coworkers. It is characterized mainly by bone overgrowth. Other additional features include cardiac and renal anomalies.

Case report: The aim of this study is to present the orthodontic treatment of a patient with Sotos syndrome. The patient is a boy who came to our Department seeking for orthodontic treatment at the age of twelve. He is characterized by bone overgrowth, macrocephaly, typical long facial appearance and mentally retardation. These traits are present in more than 90% of persons that manifest the syndrome. Besides, the patient presents a history of serious scoliosis with a surgery at the age of eleven. The clinical examination revealed a Class III Skeletal Type and Class II Angle dental malocclusion. He was congenitally missing the first and second upper premolars, as well as the second lower premolars. In addition, he presented excess of space of the upper and lower dental arch, midline deviation and mild curve of Spee. Treatment with fixed appliances was decided, focused mainly to excess space closure and to a functional occlusion.

Comments: Subsequent studies and analyses showed that more than 90% of the Sotos syndrome cases were due to intragenic NSD1 mutations and 5q35 microdeletions encompassing NSD1 gene. The multiple abnormalities and variety of clinical manifestations of the syndrome require multidisciplinary approach, simple treatment orthodontic planning and lots of patience of the clinician, due mainly to the long term jaw overgrowth even after puberty.

P28-518

Early prosthetic treatment in children with oligodontia

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Introduction: Oligodontia affects a number of patients due to but also trauma, etc. Children under 5 years of age can have many oral health problems, such as early childhood caries (ECC), dental trauma, hereditary diseases (i.e. ectodermal dysplasia) or even loss of teeth due to tumors. No consensus exists on the ideal age for beginning of prosthetic rehabilitation.

Case report: A series of cases of children under the age of 5 will be presented with varying causes of tooth loss and for which early removable prostheses have been fabricated. The fabrication protocol used was similar to an adult but several points were altered in order to eliminate the treatment time and make the experience more pleasant to children. Periodic recall visits were scheduled at 3-month intervals to monitor for changes in the developing dentition to adjust the prosthesis and to protect the existing teeth with prophylaxis and topical fluoride.

Conclusions: Prosthetic rehabilitation must be done at the earliest age possible in order to maintain and correct the oral functions, prevent growth anomalies and improve the quality of life of these young patients.

Poster Session P29/Dental Trauma 4/TMJ/Xrays/Education

P29-519

Acoustic characteristics of children of the Japanese consonants [S][J]

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Background: The articulation of children occurs in association with the developments.

Aim: We conducted acoustic analysis of these articulations in order to investigate organic effects of the oral cavity, one of the articulation organs.

Design: The subjects were composed of five healthy children (primary dentition completion) and five children with ankyloglossia. The purpose and methods of this study were explained to all subjects, and the articulation was recorded upon obtaining consent. The test sounds were selected as connecting preceding and following vowels of [a] to consonants of [s] and [j] as in VCV (vowel-consonant-vowel) syllable [asa] and [aja].

Recording was conducted in a sound insulation room.

Results: Results of measurements demonstrated that the maximum sound pressure of children with ankyloglossia tended lower than that of healthy children.

Conclusions: As a diagnosis of speech and language disorders, auditory impression is currently used in a clinical setting. On the contrary, acoustic analysis allows the visualization of articulation characteristics of patients based on figures, independent of clinical experience of the user. The study suggested that the utilization of acoustic analysis has a potential to actualize a diagnosis based more on quantitative evidence.

P29-520

Influence of the severity of temporomandibular dysfunction on the activity and thickness of masticatory muscles in children

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Background: Morphofunctional alterations can be observed in individuals with temporomandibular dysfunction (TMD). The Electromyographic (EMG) and ultrasound imaging (USI) analyses offer important information to evaluate the functional performance and pathological conditions of the masticatory muscles.

Aim: To evaluate the EMG activity and thickness of masseter and temporalis muscles in children with different severity levels of TMD.

Design: Ninety-three 7-11-year-old children attending a Dental School's outpatient service were recruited for the study. Based on the Helkimo's Clinical Dysfunction Index and other criterias, 45 children (22 boys and 23 girls) were selected and allocated to 4 groups: G1- TMD-free (control), G2- mild TMD, G3- moderate TMD, and G4- severe TMD. The EMG records were obtained using a 5-channel electromyograph during different clinical conditions. Masseter and temporal muscle thickness was measured at rest and during dental clenching using a digital ultrasound with a high-resolution real-time 56 mm/10-MHz linear-array transducer. The normalized EMG data and the USI data were analyzed by ANOVA and Tukey's test (α 0.05).

Results: Children with TMD symptoms had lower EMG activity than TMD-free children. There was statistically significant difference ($P < 0.05$) among the groups for the left temporalis muscle at rest and during lateral excursion of the mandible, and for the left masseter and left temporalis muscles in maximal intercuspatation. There was no statistically significant differences ($P > 0.05$) among the groups regarding muscle thickness.

Conclusions: The severity of TMD symptoms affected the EMG activity but it did not cause structural alterations in the masticatory muscles in the childhood period.

P29-521

Correlation between malocclusion, occlusal vertical dimension and temporomandibular disorder in children and adolescents

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Background: The presence of malocclusion associated with change in vertical dimension of occlusion is a predisposing factor to the installation of temporomandibular disorders.

Aim: Was to establish the correlation between types of malocclusion, change the vertical dimension of occlusion and temporomandibular disorder in their varying degrees of severity in children and adolescents 7–12 years of both genders.

Design: It evaluated 105 children of the Legião da Boa Vontade (LBV) in São Paulo, SP, 61 of which contemplated the inclusion criteria. The children were assessed by questionnaire, which was applied to the search index Helkimo diagnóstica of temporomandibular disorders and clinical examination for verification of the presence or absence of malocclusion and measurement of occlusal vertical dimension by means of digital caliper later. The associations between type of bite, gender, and TMD were obtained applying the Fisher exact test. The variables age and DVO were compared by gender using the Student t test. A logistic regression model was adjusted for the type of occlusion, linking it to the explanatory variables age, gender, VDO and TMD. In all analysis was set the significance level of 5% or the corresponding *P*-value.

Results: The results showed that the anterior open bite was the change in occlusal more prevalent among children and adolescents. There was a statistically significant association between vertical dimension and age in both sexes, suggesting that the vertical extent varies with age and growth. Temporomandibular dysfunction affected 68.85% of the sample, 26 (42.62%) with mild TMD, 11 (18.03%) with moderate TMD and 5 (8.2%) with severe type of TMD. No correlation was found between malocclusion, occlusal vertical dimension and temporomandibular disorder in the sample.

P29-522

Temporomandibular disorders and tension type headache in a 13-year old girl

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Introduction: Temporomandibular disorders (TMD) are occasionally associated with orofacial pain and Tension-Type headaches. TMD can affect children and adolescents as frequently as adults.

Case report: The patient referred to Orofacial Pain Management Clinic, was a 13 year old girl who was complaining of strong pain in her right TMJ, initiated by chewing. During the 4 months prior to therapy, pain relief was only accomplished with analgesics. Clinical findings included clicking from the right temporomandibular joint, painful head and neck muscles during palpation.

Patient's history revealed teeth grinding, nail biting and severe bilateral headaches, affecting her frontal and temporal areas, mostly during highly stressful school hours. Her headaches were so severe that the patient was hospitalized, mainly for diagnostic reasons. Her brain MRI and sleep study performed by the neurophysiological laboratory of the Neurological Department were negative for pathological findings. She was diagnosed as suffering from generalized TMD dysfunction – mainly of neuromuscular origin – and possibly Tension-Type Headache. Our patient and her parents were informed of the possible causes and the need for self-control of her parafunctional habits and stress were emphasized. A stabilization splint was fabricated and adjusted occlusally along with patient's clinical examination according to clinic protocol in a weekly basis. The patient's condition, headaches included, improved impressively within a month and is symptom free for the past 3 months.

Comments: Patient's co-operation is of critical importance for a positive therapy outcome which will be accomplished quicker the sooner the patient seeks professional help when TMD symptoms appear.

P29-523

Temporomandibular disorders in a 12 year old patient

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Introduction: Temporomandibular disorders (TMD) can affect children and adolescents as frequent as adults. TMD in children can have many causes including stress, parafunctional activities, injury, even growth disorders.

Case report: The patient, a 12 year old boy, came to the Orofacial Pain Clinic, complaining of headaches and severe pain in the face and neck area. Clinical findings included painful and restricted jaw movement, and during palpation painful temporomandibular joints and head and neck muscles. Patient's history revealed that he was kicked in the face a few months before the symptoms began, and had many parafunctional habits and wrong body posture during school hours and studying. The diagnosis was generalized TMD dysfunction, mainly of neuromuscular origin, aggravated by its parafunctional activities and face trauma. Both child and parents were informed of his parafunctional habits and he was advised to avoid them. He was then provided with a custom intraoral stabilization splint. The patient was examined according to clinic protocol and his splint was adjusted occlusally weekly. The patient was co-operative and his symptoms were almost eliminated until the new school year started, when admitted in a new, private junior high school, as a freshman and got under heavy stress, which caused him a slight relapse.

Comments: Parafunctional habits causing micro-trauma, wrong body posture, stress and macro-trauma are predisposing and occasionally initiating factors for TMD, presenting with orofacial pain and sometimes with a blurred clinical picture, making diagnosis and management a difficult task.

P29-524

Grinding teeth (Bruxism) in infancy and childhoodE. KARACHANIDI¹, T. SYRIOPOULOU², E. FOURLANI³, K. STRAKA², E. MICHAEL⁴ & I. TEMPELOPOULOS⁵¹Speech – Pathology, TEI of Patras, Patras, Greece; ²Pediatric department, General Hospital of Kalamata, Kalamata, Greece;³Pediatric department, Children's Hospital "Mitera", Athens, Greece;⁴Pediatric department, General Hospital of Sparta, Sparta, Greece; ⁵Private Practice, Kalamata, Greece**Background:** Teeth grinding is an involuntary, uncontrolled rolled mandible's movement in position of central occlusion.**Aim:** To report cases of bruxism cases at infant and children, investigate habits and treatment.**Design:** Seven cases were studied (two boys and three girls infant 3–4 years old, one girl and one boy 9 and 10 years old, respectively) with bruxism' symptoms. Parallel to thorough history taking, dental evaluation was made.**Results:** All parents mentioned creaking noises of teeth at children's sleep. Thumb sucking was mentioned at three cases at infants, hyperactivity and aggressive behavior at 1. Onychophagia appeared the girl. Biting cheek's inside, morning headaches and face's pain, the boy (the last case refers to a child of divorced parents with intense parental conflict who experienced intense stress). From dental examination, dental cusps were appeared flattened at one infant's case and two older children's cases, with vertical hyperflexion and palatal mucosa's injury at the boy. Infants stopped bruxism without intervention, while at the 12-year-old boy's case night splint was placed with positive results, while at cases of onychophagia, hyperactivity and anger and stress bruxism was faced with intervention at children's behavior.**Conclusions:** (i) Bruxism in the majority of cases does not impact at children's teeth and stops without intervention. (ii) Addressing bruxism (dental intervention, behavioral intervention) exempts children's teeth from possible later problems.

P29-525

Cone beam CT findings of fibrous dysplasia in children and adolescents

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Introduction: Fibrous dysplasia is a fibroosseous lesion not of periodontal ligament origin. It usually affects children, adolescents and young adults. In most of the reported cases fibrous dysplasia has been diagnosed during radiographic examination of the jaws. Cone Beam Computed Tomography (CBCT) is a new low dose 3D imaging technique of the maxillofacial region. The aim of this presentation is to describe the most common CBCT findings of fibrous dysplasia in children and adolescents.**Case report:** Five cases, four males and one female, aged between 13 and 17 years old, with main symptom swelling of the jaws, were examined with CBCT (Newtom, QR Verona Italy). All cases were monostotic and solitary, affecting either the maxilla (three cases) or the mandible (two cases). Buccolingual expansion and ground glass opacification were the most characteristic findings of fibrous dysplasia. Two cases were in the intermediate stage and three in the mature stage of the disease. The mandibular cases exhibited expansion of the mandible as well as buccal, lingual or downward displacement of the mandibular canal. In the maxillary cases fibrous dysplasia extends in to the palate and the maxillary sinus.**Comments:** In most cases radiographic imaging is the main examination for the diagnosis of fibrous dysplasia, whereas it provides characteristic findings. CBCT is the most adequate imaging modality for definite diagnosis of fibrous dysplasia and

for the evaluation of the specific dimensions and radiodensity of this lesion. The radiographic findings in this case study are in agreement with the findings of other reports.

P29-526

Radiographic localization of supernumerary teeth in maxilla

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Background: Localization of supernumerary teeth is essential for diagnosis and treatment planning, and several techniques have been reported in the literature. Nevertheless, vertical tube shift (VTS) and horizontal tube shift (HTS) techniques are commonly used for localization of supernumerary teeth.**Aim:** This study sought to evaluate the reliability of two different localization techniques (VTS and HTS) for supernumerary teeth.**Design:** Seventy five patients were randomly selected from the records of paediatric patients at the Prince Philip Dental Hospital. Only non-syndromic patients with single supernumerary teeth, and complete clinical and radiographic (PAN, AO, PA and CBCT) records were included. Ten examiners independently rated 75 pairs of radiographs for each technique. Descriptive statistics were computed using chi-square test and kappa statistics was employed to assess the intra- and inter- observer reliability.**Results:** Data from 750 pairs were available for analysis. The overall sensitivity for VTS and HTS was 73% and 72.9% respectively with slight inter- and good intra- examiner reliability. Statistically significant differences were not evident between the two techniques for localizing supernumerary teeth.**Conclusion:** Based on the findings of this study, an approximate 27% failure rate was evident for both VTS and HTS techniques.

P29-527

Treatment of a 14- year old patient with multiple teeth loss

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Introduction: Trauma is very frequent in children and adolescents. One of the most common dental traumas is tooth avulsion. When a tooth is displaced totally out of its socket, immediate replantation and splinting is the treatment of choice. However, good results can be expected even after a few hours' delay, provided that the tooth is stored properly. When repositioning does not occur in time, prosthetic solutions, such as removable partial dentures or resin-bonded bridges should be considered.**Case report:** The aim of this presentation is to discuss the alternative treatments of teeth loss using as an example a 14-year old boy who presented to the clinic two days after a school-accident, where five permanent teeth (#11, 21, 22, 23 and 24) were avulsed. The patient was hospitalized due to a broken arm. Three out of five teeth were brought to us, but replantation was no longer possible. Partial anodontia of the upper dental arch was treated temporarily with a removable partial denture with Adam clasps at the first permanent molars. This restoration will be replaced following the child's growth. The possible definitive treatment can be either implant placement or a fixed partial denture. However, the x-ray of the wrist indicated that the final restoration cannot be performed for at least 3 years.**Comments:** The case described indicates how vital the instant replantation of avulsed teeth is. As far as children are concerned, the consequences involve a prolonged treatment period where the final outcome cannot be fully predicted.

P29-528

School teachers' knowledge and practices concerning emergency care of children with avulsed teeth

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Background: Traumatic injuries, especially tooth avulsion are increasingly reported among school children in Lagos, Nigeria. However, they do not receive emergency care in school, treatment is delayed, resulting in reduced survival of the tooth.

Aim: To determine the knowledge and practices of school teachers concerning emergency care of children with avulsed teeth.

Design: A cross-sectional survey of teachers in two primary and two post primary schools in a local government area in an urban setting in Lagos, Nigeria was carried out. Questionnaires were used to collect information on demographic data, teaching experience, previous information (and source) on tooth avulsion, emergency care of the child, storage and handling of the avulsed tooth and transportation to the clinic.

Results: Sixty two teachers, aged 28–59 years, comprising 24 (38.7%) males and 38 (61.3%) females participated in the study. Majority (72.6%) had university education and more than 10 years of teaching experience. However, only 32.3% had received information previously on emergency care of tooth avulsion, the major source of information being the hospital (55%), and school seminar (30%), 34% of teachers had experienced tooth avulsion in school children, 14% knew the tooth should be stored moistened before getting to hospital, 9% had idea of a storage medium and only 2% knew the avulsed tooth could be re-implanted.

Conclusions: Few teachers had good knowledge of care of children with tooth avulsion in the population studied. It is recommended that teachers be given continuing oral health education regarding emergency care of dental injuries in school children.

P29-529

Conservative approach for the rehabilitation of anterior tooth trauma: two case reports

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Introduction: Anterior crown fractures are a common form of traumatic dental injuries that mainly affect the central incisors, in children and adolescents. Treatment of dental trauma is complex and requires a comprehensive and accurate diagnosis and treatment plan. The development of adhesive dentistry has essentially changed the restorative management of fractured teeth. Thus, one of the options for managing coronal tooth fracture, when the tooth fragment is available and there is no or minimal violation of the biological width, is the reattachment of the dental fragment. On the other hand, complex cases, in which more than one tooth are involved with different types of fractures, require specific treatment of each fracture.

Case report: This clinical report describes the rehabilitation of a 14-year-old patient with dissimilar crown fractures of the upper and lower right central and lateral incisors. A multidisciplinary treatment approach was used for the rehabilitation of the dental fractures. In the second case, a 6-year-old patient presented an uncomplicated fracture of enamel and dentin. In this case the fractured fragment was reattached to the remaining tooth structure using the advantages offered nowadays by the adhesive dentistry.

Comments: Reattachment of the fractured fragment to the remaining tooth is a conservative and cost-effective approach for restoring fractures of enamel and dentin while the treatment plan for a complicated trauma is more complex and requires the successful collaboration of different dental specialists.

P29-530

Undergraduates experience and confidence in paediatric dentistry: two years multi-centre evaluation

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Background: Previous studies have reported potential deficiencies in undergraduate paediatric dentistry experience, both in the UK and worldwide.

Aim: To compare undergraduate self-reported experience and perceived clinical confidence in paediatric dentistry within three UK dental schools over two consecutive years.

Design: Final year dental students completed an anonymous questionnaire to capture experiences of core clinical skills in both hospital and outreach settings. A visual analogue scale (VAS) was used to record perceived levels of confidence. 147 and 189 questionnaires were completed in 2009 and 2010 respectively. During the 2009/2010 academic year, new trauma learning courses were introduced within the three schools to address an area of perceived need.

Results: In both years, 100% had experience of providing preventive and simple restorative treatment and 95% had experience of dental extractions for children. Across the three schools, only 63% and 65% of 2009 and 2010 graduates respectively had gained any experience of managing trauma-related cases. Despite the introduction of extra teaching resources, there was no difference in the self-reported competencies between the two years with a mean VAS of 5.05 (SD = 2.05) and 4.59 (SD = 1.98) for 2009 and 2010 respectively. There were significant inter-school differences in the percentages of students who had undertaken preformed metal crowns (PMC). In addition, there had been a significant increase in students' experience of PMC placement over the study period for two of the dental schools ($P < 0.05$).

Conclusion: Teaching of dental trauma requires development of creative learning recourses, utilising e-learning as an adjunct to increase undergraduates' perceived confidence.

P29-531

Greek paediatricians knowledge about child's oral health

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Background: Dental caries is still considered the most common chronic disease of childhood and that is why parents need to be educated regarding its prevention. The dentist is the most appropriate to provide parental advice, however rarely examines very young children, and as a result paediatricians' contribution is essential.

Aim: The aim of this study is to determine whether paediatricians in Greece have adequate knowledge regarding oral health and explore the factors that influence their knowledge status.

Design: The data was collected from 108 questionnaires that were returned in a paediatrician meeting that was held in Athens and which included information about demographic and practice characteristics and a 10-item knowledge quiz regarding oral health.

Results: The mean age of the sample was 47 years. Regarding their practice towards oral health, 53% of them perform dental examination, 59.3% refer to a dentist until the age of 36 months and 54.6% inform parents about oral health by the age of 12 months. The median knowledge score was 5. In seven out of the 10 questions at least 43% gave the wrong answer, with the question regarding the use of sealants being the most often incorrectly answered. The knowledge score was significantly influenced by graduation country ($P = 0.026$), age of dental referral ($P = 0.049$) and their interest in receiving further dental education ($P = 0.029$).

Conclusion: The oral health knowledge of Greek Paediatricians is found to be inadequate and more dental training is required in order to improve the oral health of children.

P29-532

The role of Chilean paediatricians in children's oral healthC. ZAROR¹, B. HOPE¹, C. VERGARA¹, J. DÍAZ¹ & L. BUSTOS²*¹Dental Department, Faculty of Medicine, University of La Frontera, Temuco, Chile; ²Public Health Department, Faculty of Medicine, University of La Frontera, Temuco, Chile*

Background: The paediatrician holds a close relationship with children and their parents during the first years of life. As so, this professional has regular opportunities to perform screening dental examination in young children and to educate their families on preventive oral health.

Aim: To assess paediatricians' knowledge, attitudes and professional experience regarding children's oral health.

Design: A survey was responded by 164 paediatricians attending the 50th Chilean Pediatrics Convention. The survey questionnaire was

translated and adapted from a national survey for paediatricians designed by the Department of Pediatrics, University of Washington. The face and content validity of the instrument was evaluated through a focus group with Chilean paediatricians. The survey included demographic data, elements related to the knowledge about oral preventive therapies, their own role in oral health promotion, their experience to screen oral problems and the barriers to refer patients to the dentist.

Results: A number of 64% of the responded paediatricians reported to diagnose dental cavities in preschool children at least once a month. 51.53% agreed with referring children to the dentist from the age of 1, however 55.82% found difficulties to successfully refer children under 2 years old. Only 3% of the respondents answered all knowledge questions correctly. 66.87% never received training in oral health during their paediatrics specialization studies.

Conclusions: In spite of the general consensus about the relevance of oral health and the frequent encounter with oral pathologies, paediatricians acknowledge that they do not possess enough knowledge nor referral strategies to participate in their prevention.

P29-533

Early student experience in paediatric preventive dentistry

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Background: A prevention clinic was introduced for children requiring treatment under general anaesthesia, in order to improve the children's oral hygiene and increase student exposure to child patients.

Aim: This study aimed to evaluate students' performance in the prevention clinic through use of clinical database and feedback questionnaires.

Design: Data was collected via the clinical database, and questionnaire feedback from third year students was analysed using SPSS.

Results: Seventy four questionnaires were returned, which represented 94% of the year. Each student had seen an average of 4 children. 74.3% of students had seen children up to 5 years old, 91.9% children aged from 6–12 years and 26% of them had seen children older than 12 years. 94.6% of the students said that the prevention clinic helped them to develop communication with child patients, 71.6% with behaviour management, and 70.3% reported that it helped them to develop teamwork. 90.5% reported that it helped them to improve diet analysis and advice, 93.2% said it helped them with toothbrushing instruction, and 77% said it helped with fluoride application. Using a Likert scale from 1 to 5, the mean values for the level of confidence felt providing prevention was 3.92 (SD 0.66) and for communication skills for more complex treatment was 3.43 (SD 0.86).

Conclusion: Third year students feel that they have benefited from early introduction to paediatric dentistry, and this has allowed them to develop skills for when they provide more complex treatment to children.

P29-534

A questionnaire evaluation of small-group pre-clinical advanced practice of pediatric dentistry in Japan

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Background: Dental education in Japan is currently undergoing remarkable changes. Small-group practice for pediatric dentistry has conducted to the 4th-year dental students in our university as a part of Integrated Clinical Basic Practice for undergraduate clinical training since 2003. We have revised some contents of the program in response to the changing needs of students.

Aim: This study aimed to identify the dental students' perception on the small-group pre-clinical advanced practice of pediatric dentistry for undergraduate clinical training by comparison of two questionnaire surveys of the 4th-year dental students one in 2010 and the other in 2003.

Design: An anonymous questionnaire regarding the small-group practice of pediatric dentistry was completed by the $n = 130$ students in 2010 and $n = 117$ in 2003. The differences in the students' perceptions were statistically analyzed.

Results: Response rates was 96.2% for the students in 2010 and 100% for the students in 2003 respectively. Regarding, 'topical application of fluoride' and 'pit and fissure sealant', significant differences were found in 'difficulty for practice' and 'propriety of practice time', between the two groups. More than 95% of the students in both groups were satisfied with their dental educators.

Conclusions: These results suggested that the modifications of the contents of the program could influence the students' perception. Although the contents were increased without the prolongation of whole practice time, the students' satisfaction level at the practice was maintained.

P29-535

Applicability of blended learning in the discipline of paediatric dentistry – school of dentistry – university of Sao Paulo – Brazil

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Background: FOU SP Pediatric Dentistry Discipline has developed a course for the empowerment of post-graduation students to aggregate the competences of an online course tutor provided in Teledentistry. During three years, 20 post-graduated students graduate as tutors and had the participation of 192 undergraduate students. It was proposed to this group that they would be tutors of graduation students, creating a course that is complementary to the curriculum framework (Psychology, Radiology, Surgery, Development of occlusion, Clinical exam, Cariology, Dentistry, Injuries noncarious, Fluoride, Trauma, Emergency and Endodontic).

Aim: With the aim of making use of content flexibilization, this work shows the use of the Learning Virtual Setting (Moodle), with the student's participation as a subject in the teaching-learning process and within the required skills and competences for the professional education, contributing to Telehealth-education.

Design: A questionnaire was administered in order to evaluate the competences gained by the post-graduation students. To graduation students, a baseline and a final questionnaire was administered too. The adhesion rate to the modules ranged from 78–82%. We analyzed the theoretical notes before the availability of additional classes in the platform and thereafter. Paired t test was performed to compare notes with self-assessment by students themselves. Student assessment, 75–89% reported having increased knowledge. As for the notes, the mean difference was an increase from 0.5 to 1.2 ($P < 0.01$).

Conclusion: It can be concluded that the implementation of new technologies in teaching-learning process in undergraduates still have restrictions, but most students benefit from supplementation with interactive lessons, with an increase of knowledge.

P29-536

E-learning and paediatric dentistry at the university of rennes 1

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Background: In 2007 the Department of Paediatric Dentistry of Rennes started to use an e-learning program for undergraduates in 4th year, using the MoodleTM platform, with the help of the CIRM (structure of the University of Rennes 1 dedicated to new technologies and methods in Paedagogy). This poster presents the use of online resources for lectures and practicals.

Aim: The aim of this study was to assess the way students appreciated this kind of paedagogy.

Material and Methods: Since 2007, five items have been developed to replace initial lectures: Clinical exam, Treatment of primary teeth, Immature teeth/Traumatism, Dental anomalies, Prescription/Dental anaesthesia. In 2009 another online resource was developed together with other dental departments in Rennes to help students prepare or perform practical sessions: both objectives, schedules, explanations, illustrations and videos were dedicated to the sessions.

Results: This method of learning was well appreciated by the students throughout the years: > 80% of overall satisfaction, good participation to forums and tutored activities. In 2007 the main problems were related to the access to computers and internet: 44% of the students had no computer and 82% no access to internet at home at the beginning of the academic year. This has been partly solved in the following years.

Conclusions: This experience was very appreciated by both students and teachers. Other modules of Paediatric Dentistry are now in development under the direction of the College of teachers in Paediatric Dentistry in order to harmonize teaching of Paediatric Dentistry in France.

Poster Session P30/Syndromes & Genetics 3

P30-537

Freeman Sheldon syndrome: a case report

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Introduction: Freeman –Sheldon is a rare congenital disorder defined by skeletal abnormalities, joint contractures and typical facial features. Dental crowding with narrow dental arches is frequent. The phenotype of FSS includes scoliosis, dysphasia, failure to thrive and life threatening respiratory complications due to structural anomalies of oropharynx and upper airways.

Case report: A 4 year old boy was referred to the department of Pediatric Dentistry of Shahid Beheshti University, Tehran, Iran in January of 2010. The patient had scoliosis, club foot, finger joint abnormalities accompanied by ulnar deviation. The tone of his speech was impaired by restriction in mouth opening. Intraorally, the upper and lower lip musculature were deeply folded. Mouth opening was limited and it resulted to poor oral hygiene and restricted access for clinical examinations. Narrow upper and lower dental arches with severe lower dental crowding and high valued palate were noted. Occlusal and interproximal carious lesions were also present.

Cavity preparation was done in short episodes regarding to access limitation and lack of sufficient moisture control and inability of rubber dam application. High quality dental materials and self etch bondings such as Clearfill SE bond were used.

Comments: A multidisciplinary approach consisting of preventive measures, early referral to pedodontist, and orthodontic consultation should be considered in the treatment of F.S. patients.

P30-538

Treacher-Collins syndrome: case report.

Interdisciplinary treatment plan and the role of the paediatric dentist

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Introduction: On the basis of one case report and a review of the literature the most important aspects of epidemiology, pathogenesis, clinical manifestations, diagnostics and therapy of Treacher-Collins (-Franceschetti) syndrome (TCS) are discussed.

Case report: Treacher-Collins syndrome or Mandibulofacial Dysostosis is a rare syndrome, inherited in an autosomal-dominant pattern. The disease is caused by a mutation in gene TCOF1, which appears 60% de novo. In this case, a heterozygotic mutation in exon 11 of TCOF1 gene (c.1535_1536insC) was found in a girl born

Oct 2010 with TCS. The pregnancy and other parameter at birth (weight, length etc.) did not show any abnormalities. Facial features of the mother indicate the possibility of an undiagnosed mild form of TCS. The phenotype of the child includes malformed ears, underdeveloped zygomatic bones, micrognathia of the lower jaw, abnormalities of eyelids and eyelashes, conductive hearing impairment and dysphagia. The first results of the interdisciplinary treatment and the therapy plan are presented.

Comments: A paediatric dentist should be in the interdisciplinary team to treat TCS-children in order to compensate for additional risk factors for caries and periodontitis and to avoid complication due to these diseases in an already impaired child. In cooperation with an orthodontist, deviations in the facial growth patterns and abnormalities of the teeth should be closely monitored and compensated.

P30-539

Pierre-Robin Sequence – stickler syndrome. Report of two cases

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Introduction: The Pierre-Robin Sequence (PRS) is a group of varied anomalies derived from the brachial arch malformation. The Stickler Syndrome (SS) is a connective tissue disorder including a series of anomalies. Both PRS and SS clinically involve the triad of micrognathia, glossoptosis and cleft palate. Presented here are one PRS case and one SS case that were successfully treated in the Postgraduate Clinic of Pediatric Dentistry – University of Athens, Greece.

Case report: A female patient, aged 4 years old, appeared in our clinic and was diagnosed with SS. The patient presented ankyloglossia, micrognathia of the mandible and a surgically treated cleft palate. A second female patient, aged 5 years old, also appeared in the same clinic of the University. This patient was diagnosed with Pierre-Robin Sequence and presented narrow maxilla, anterior crossbite and was also surgically treated for the cleft palate after birth.

After thorough professional dental care treatment, preventive orthodontics started with transversal expansion and bite rising removable appliances. In both cases those appliances were used 24 h a day for a period of 1 year. The appliances were activated by the patients' parents once a week achieving a normal and stable occlusal pattern.

Comments: Although they appear with a low prevalence, PRS (one in 10.000–14.000) and SS (one in 7.500–9.000) require a timely diagnosis and a complex treatment plan in order to successfully provide proper function of breathing, swallowing and speech.

P30-540

Chondrosarkoma of the mandibular condyle in a patient with Werner Syndrome

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Introduction: Werner Syndrome is an uncommon, autosomal recessive human genetic disease that mimics premature aging. Patients with Werner Syndrome appear to age rapidly following puberty, and are at increased risk of developing cancer and cardiovascular disease. Symptoms include premature graying and loss of hair, bilateral cataracts, osteoporosis, atherosclerosis, diabetes, scleroderma-like changes and ulceration of the skin.

Case report: A 26 year old male patient with a previous diagnosis of Werner Syndrome was referred to the outpatient clinic of our department. His major complaints at this time were swelling and pain in the left preauricular area. General physical examination on admission revealed thin extremities and atrophied skin. His external genitalia appeared atrophied. There was extensive abnormal pigmentation of the skin and telangiectasia was evident. His face looked aged and his voice was high-pitched and hoarse.

A partially irregular, elastic, hard mass was palpated on the surface of the left preauricular area. Deviation of the jaw was evident during opening of the mouth. Facial nerve function was intact. Patient's evaluation was comprised of an OPG and CT-scan. An Open biopsy of the mass was suggestive of malignancy. A hemimandibulectomy was undertaken and the patient was reconstructed with a reconstruction plate and artificial condyle.

Comments: Werner syndrome has distinctive characteristic features, habitus and many resultant diseases due to premature senescence. Of these various diseases, this report focuses on cancer in particular. It is essential when evaluating such patients that we must pay attention to the possibility of malignancy.

P30-541

Pre-surgical nasal alveolar molding for unilateral cleft lip/palate patients

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Background: Presurgical nasal alveolar molding (PNAM) is a non-invasive technique designed to approximate both soft tissue lip and alveolar cleft segments. As well, the affected nasal cartilages remodeled.

Aim: To remodel the affected nasal cartilage and to approximate the alveolar cleft and lip segments in order to achieve surgical closure under minimal tension.

Design: Amaxillary Sil-Tech® putty impression is made within 3 weeks from birth. The baby is inverted for the impression to protect the airway. The appliance is fabricated on the stone model using Triad®, acrylic base. Weekly adjustments are made for up to 16 weeks through acrylic addition and subtraction. Tape is used externally to stretch the soft tissues for lip approximation. A button is added externally to remodel the alar cartilage while closing the cleft to ± 2 mm from ± 13 mm.

Results: Alveolar ridge approximation from ± 13 mm to ± 2 mm is accomplished. Soft tissue taping approximates the lip segments in a similar manner while the affected nose cartilage is remodeled.

Conclusions: This technique has effectively allowed for surgical lip closure under minimal tension, ultimately resulting in minimal scar

formation. This technique has been demonstrated to eliminate the need for up to 1.7 surgical revisions.

P30-542

The trio of cleft lip/palate, poly/syndactyly and genitalia abnormalities as associated with rare genetic syndromes: three cases of fetal autopsy

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Introduction: Three male fetuses are presented with cleft lip/palate, poly/syndactyly, and abnormal genitalia. Evidence collected at autopsy with macroscopic overview, histological sections and radiography was analyzed in order to set the diagnosis.

Case report: (i) The first male fetus presented additional cryptophthalmia with microphthalmia and ocular dysplasia which indicated the Fraser Syndrome. (ii) In the second male fetus, the combination of Intrauterine Growth Restriction (IUGR), cleft palate, postaxial polydactyly, Y-shaped toe syndactyly, sex reversal, cardiac defect, unilobar lungs and cerebellar and renal hypoplasia, was characteristic of the Smith-Lemli-Optitz Syndrome (SLOs). (iii) The third male fetus revealed additional lung hypoplasia. Radiography showed the typical findings of the Short Rib – Polydactyly Syndrome, type II (Majewski Syndrome), with an extremely narrow thorax and short tubular limb bones.

Comments: Cleft lip/palate, a common fetal malformation observed prenatally by ultrasound, when associated with other congenital abnormalities in particular settings, may lead to the correct identification of a rare genetic syndrome at autopsy.

P30-543

Dental management of a case with Apert Syndrome

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Introduction: Apert syndrome is a congenital disorder characterized primarily by craniosynostosis, midface hypoplasia, and syndactyly of the hands and feet with a tendency to fusion of bony structures.

Case report: An 8 year old Caucasian male attended the Post-graduate Paediatric clinic of the Athens University for dental care. He presented hyperterolism, exorbitism and vertical excess of the lower third of his face. The intraoral findings were: bifid uvula and very high vaulted palate, severe crowding and, consequently, delayed eruption of permanent teeth. The diagnosis of the syndrome was based on clinical observations. Dental treatment provided, consisted of: a) extractions of anterior and posterior primary teeth due to pulp necrosis and dentoalveolar abscess, and b) pulpotomy and placement of stainless steel crowns on carious posterior teeth. Also, a lingual arch was placed as space maintainer. The patient was enrolled in an every-3-months individualized follow-up preventive program which consisted of tooth cleaning, fluoride application, oral hygiene instructions and dietary counseling. At the 6 months follow-up, the oral hygiene of the child was satisfactory and this will encourage the application of orthodontic treatment. The parental participation in the daily oral health care of the child was crucial for the outcome.

Comments: The management of the present case indicates the importance of patient and family motivation for the oral hygiene and regular dental attendance. These two factors are essential in maintaining the oral health of patients with impaired motor skills and severe orthodontic problem like in the case of this child with Apert syndrome.

P30-544

Solitary median maxillary central incisor (SMMCI) syndrome: Case report

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Introduction: Solitary median maxillary central incisor syndrome is a complex disorder consisting of multiple, mainly midline defects of developmental origin from unknown aetiologic factor(s) present during the 35th–38th day(s) of gestation.

Case report: The patient was a 17-year-old Moroccan female, with hypotelorism and a congenital nasal malformation. The chief complaint was maxillary protrusion and dental crowding. The patient had a convex profile, with excess vertical height. Intraoral examination revealed one central incisor in the maxilla and class II molar relationship. The panoramic radiograph confirmed the absence of one maxillary incisor.

Comments: Solitary median maxillary central incisor syndrome (SMMCI) is a complex disorder and multidisciplinary approach is needed for proper management of the patient.

P30-545

Turcot syndrome: report of a case and review of the literature

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Introduction: Turcot syndrome is a rare hereditary disorder characterized by association of colonic polyposis with tumors of the central nervous system (CNS). Phenotypic differences observed may be related to the location of the mutation within the APC gene. The CNS tumors in individuals with APC mutations are typically medulloblastoma, whereas those with mismatch repair mutations are usually glioblastoma multiforme.

Familial adenomatous polyposis is characterized by a series of gastrointestinal manifestations, which usually appear in childhood. Extracolonic manifestations are variably present and often include the oral cavity. Osteomas and dental abnormalities such as unerupted teeth, congenital absence of one or more teeth,

supernumerary teeth, odontomas and dentigerous cysts, have been reported in approximately 17% of individuals with familial adenomatous polyposis compared to 1%–2% of the general population.

Case report: Report of a case of Turcot syndrome in a 26-year old woman with multiple adenomatous polyps of the colon and glioblastoma multiforme. The patient was diagnosed 10 years ago with familial adenomatous polyposis and underwent surgical removal of glioblastoma in 2001 and colectomy 5 years later. Clinical and radiographic examination revealed the presence of caries in association with dental abnormalities.

Comments: Patients with Turcot syndrome should be surveilled closely by the dentist, due to the increased risk of dental abnormalities and poor oral health. Consulting the patient's physician prior to dental treatment and regular medical follow-ups during dental treatment are of extreme importance.

P30-546

Loeys-Dietz syndrome, clinical manifestation: a case presentation

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Introduction: The Loeys-Dietz syndrome (OMIM 609192) is a recently described aortic-aneurysm syndrome with widespread systematic involvement. The disease is characterized by the triad of hypertelorism, cleft palate or bifid uvula and arterial tortuosity with aneurysms. The syndrome is caused by heterozygous mutations in the genes encoding transforming growth factor β receptors 1 and 2 (TGFBRI and TGFBRII respectively). Two subtypes have been delineated: type I is the typical syndrome, with craniofacial involvement and type II where in the face is reportedly normal.

Case report: Our case report describes a 14-year-old Greek girl, with type I Loeys-Dietz syndrome and the orofacial manifestations. Genetic test revealed a heterozygous mutation in the TGFBRII gene. The mutation was not detected in any of the parents. Chromosomal analysis revealed a normal female karyotype. The patient underwent cranioplastic surgery and aortic root replacement. The characteristic craniofacial findings of hypertelorism, down slanting palpebral fissures, strabismus, and ptosis of eyelids were present. Dental manifestations included high-arched palate, lack of space in both arches, upper and lower midline deviation. Dental treatment included individual preventive program, prophylaxis and extraction of teeth. Orthodontic treatment was recommended to her parents as well as 3 month recall examinations.

Comments: Frequent recalls is important for this type of patients. Early orthodontic treatment was decided in order to correct the cross bite and to create space for the eruption of permanent teeth.

P30-547

Oral manifestation of Hyper IgE syndrome

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Introduction: Hyper-IgE syndrome (HIES) is a rare primary immunodeficiency, inherited in autosomal recessive / dominant manner. In some cases it is the effect of genes mutations (STAT3). HIES is characterized by elevated concentration of IgE immunoglobulin in serum accompanied by peripheral blood eosinophilia, recurrent abscesses of skin or internal organs, severe pulmonary infections and pathological bones fractures. Most patients typically present with coarse face, wide-set eyes, rough skin. Predisposition to disorders of teeth and infections in the oral cavity are frequently observed in these patients.

Case Report: Oral condition was clinically assessed in four patients with confirmed STAT3 mutations, including periodontal tissues, oral mucosa, teeth (dental caries, developmental abnormalities). Additional tests were used: panoramic X-rays and mycological examination. All patients showed: gingivitis with local proliferation and lichenoid changes on the mucous membrane of cheeks, dental caries, high titers of *Candida albicans*. Rarely seen in these patients: chellitis, erythema and erosions of the oral mucosa, pseudomembranous raid. Concerning teeth condition – abnormal tooth wear, enamel hypoplasia of permanent teeth and persistent deciduous teeth. Analysis of panoramic radiographs showed the presence of retained permanent teeth, abnormal bone structure with foci of osteolysis and osteosclerosis.

Conclusions: Phenotypic features of HIES in the mouth mostly appear to be hyperkeratotic changes and disturbances of the

process of teeth eruption. Patients with HIES require multidisciplinary treatment. It is also essential to implement appropriate dental procedure as soon as possible.

P30-548

Multidisciplinary dental treatment of a child with Goldenhar syndrome

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Introduction: Goldenhar syndrome (GS) is a rare congenital anomaly also known as oculo-auriculo-vertebral syndrome or hemifacial microsomia. GS is associated with unilateral abnormal development of the first and second branchial arches. As a result facial asymmetry, cleft lip and palate and anomalies of the eye, ear, teeth, vertebrae and heart may develop.

Case report: A 4 year old female with GS was referred to the graduate clinic of paediatric dentistry at University of Athens for dental treatment. Extraoral clinical examination revealed facial asymmetry, hypoplasia of the mandible and left ear deformity. The main intraoral clinical findings were poor oral hygiene along with multiple carious lesions. Treatment plan included individualized preventive program, oral rehabilitation with composite resin restorations, stainless steel crowns, pulpotomies and extractions and early orthodontic treatment to promote growth of the hypoplastic side of the mandible with a Harvold activator.

Conclusion: GS is a rare syndrome presented in children with oral manifestations and facial deformities. Pediatric dentists should be a part of the multidisciplinary team required for the management of these children in order to apply individualized preventive program during the long duration of orthodontic treatment.

Poster Session P31/Cariology 4

P31-549

Efficiency evaluation of fluoride varnish caries-preventive for preschool-children in the community: a 2-year clinical trial

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Background: Prevalence of primary caries among preschool-children at 3 to 4-yr-olds as high as more 30 percent in Nanjing area. It is necessary that apply effective means of caries-preventive of fluoride for preschool-children.

Objective: The aim of this trial was to determine the effects of fluoride varnish on caries-preventive for preschool-children.

Methods: Total 700 preschool-children, 3 to 4 years of age were equally divided to two groups, test group ($n = 350$) and control group ($n = 350$). Test group was treated with topical applications twice per annual, in which with Copal fluoride varnish (USA) total two years, control group without any caries-preventive of fluoride method.

Results: At baseline caries prevalence rate, dmft, dmfs in test and control groups there were no statistical differences ($P > 0.05$). After 2 years, the rate, dmft and dmfs of decrease in caries incidence of test group, which were 39.88%, 44.16% and 43.54% respectively, when compared with control group there were significant difference ($P < 0.01$).

Conclusions: Fluoride varnish was effect and safe on caries-preventive of deciduous teeth for preschool-children.

P31-550

Clinical radiological diagnostics of caries on the aproximal surfaces of permanent teeth in children and teenagers

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Background: Nowadays early diagnostics and caries treatment of aproximal surfaces of teeth in children are poorly studied. Early diagnostics involves orthopantomography (OPG) enabling to store, pile up images in great numbers without limitations, handle and analyze them in detail on the computer.

Aim: The aim was to find out the potential of digital orthopantomography for early caries diagnostics on the aproximal surfaces of permanent teeth in children.

Design: Medical histories and digital orthopantomograms of 188 children aged 6–18 were studied. CFE and cf indices as well as caries localizations were taken into account. This data was compared with that of OPG of the same patient.

Results: The average DMF index according to the medical histories was 6.96 – this is a high level of caries intensiveness. On OPG

images caries of aproximal surfaces was found in 26% cases, while it was not clinically determined and indicated in the dental formula of patients. Caries lesions on aproximal surfaces of molars was found oftener – 50 teeth (72.5%), among them – molars of the lower jaw – 84%, of premolars – in 24.6% cases (17 teeth), of incisors – significantly rarer – in 2.9% cases (two teeth).

Conclusions: Digital OPG is an optimal method for early diagnostics of caries on aproximal surfaces. This method enables to found out hidden caries lesions and apply a minimal radial dose that is of high importance in paediatric dentistry.

P31-551

The change in the caries activity of children treated with fixed orthodontic appliances

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Background: The treatment with orthodontic appliances may cause increase in the volume of dental plaque that might cause in turn a higher incidence of pathology, as enamel demineralization.

Aim: This study was undertaken to elucidate the effect of the fixed orthodontic treatment on the caries activity in children.

Design: Sixty children aged 12–14 years old with permanent dentition divided into two groups, with the one treated with fixed orthodontic appliances whilst the control group didn't. Clinical examination and saliva samples were collected for both groups before the insertion of orthodontic appliances for the study group and at other three visits with specific time intervals. The salivary samples were subjected cultured on selective media for *Streptococci mutans* and *Lactobacilli*.

Bacteriological examination was then carried out to assess the colony forming units per milliliter (CFU/mL) in each sample, DMFS index was assessed; the flow rate and pH of unstimulated whole saliva were measured and compared between visits for both groups.

Results: A highly significant increase in the CFU/mL saliva of the cariogenic bacteria was found compared to control group of children during the first 3 months of the orthodontic therapy. In addition, a highly significant increase in the unstimulated salivary flow rate with no significant difference in salivary pH and no significant differences in the caries experience (DMFS), it was found in the study group during the first 3 months of orthodontic therapy.

Conclusions: The increasing change of caries activity during orthodontic treatment is a common complication of orthodontic fixed appliance therapy. This study draws attention to the importance of prophylactic programs and dental health education for parents and children who are undergoing orthodontic treatment.

P31-552

Anti-microbial effects of plant extracts against cariogenic oral bacteria

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Background: In recent years, much attention has been focused on identification and development of natural products with disease-preventing and health-promoting benefits. Medicinal plant extracts containing polyphenols exhibit antimicrobial activity against some oral pathogenic microorganisms.

Aim: The aim of the present study was to *in vivo* examine the anti-microbial efficacy of an experimental mouthrinse containing polyphenols in reducing *Mutans streptococci* and *Lactobacilli* levels in saliva using a means of selective culture media.

Design: The study sample consisted of 44 children divided into a study group (A) and a control group (B). Group A were instructed to rinse with an experimental mouthrinse containing plant extracts and Group B received a placebo mouthrinse.

Salivary counts of *S. mutans* and *Lactobacilli* were estimated with a chair-side test at baseline, at the third and the seventh day of the experimental study.

Bacterial colonies were categorized as high ($\geq 10^5$ colony forming unit (CFU)/mL of saliva) or low (10^5 CFU/mL).

Results: Lower levels of salivary *S. mutans* and *Lactobacilli* were recorded after the conclusion of the experimental period respect to the baseline data in the test Group. No significant differences was observed between the baseline and the final samples both for the *S. mutans* and The *Lactobacilli* in the control Group.

Conclusion: These findings suggest that plant extracts represent a natural anti-cariogenic agent by exhibiting antimicrobial against *S. mutans* and *Lactobacilli* responsible for initiating dental caries.

P31-553

Chemomechanical caries removal using a papain-based gel: a randomized clinical trial

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Background: The knowledge of the caries process has allowed the development of minimally invasive techniques that can be performed with minimal discomfort to the patient and maximum preservation of dental tissue.

Aim: To evaluate the efficacy of a papain-based gel in caries removal.

Design: Twenty children with at least two carious molar teeth without pulpal involvement participated in this randomized clinical trial. A total of 40 teeth were randomly divided into two treatment groups: group A, papain-based gel; and group B, conventional technique. Data collection included the time required for caries removal, need for local anesthesia, degree of discomfort, changes in

the number of viable bacteria, and clinical evaluation of glass ionomer-cement restorations 6-month post-treatment.

Results: No significant differences in the time required for caries removal ($P = 0.144$) were observed between group A (mean 4.66 min) and group B (mean 3.30 min). There were also no statistical differences in the degree of discomfort ($P = 0.054$) and need for local anesthesia between groups. One month after treatment, the success rate of restorations was 100% for both groups and, at 6-month post-treatment, the success rate of restorations was 95% for group A and 90% for group B. A significant reduction in the number of viable bacteria was observed in group A (before treatment, 11.64×10^3 ; after treatment, 1.61×10^3 ; $P = 0.027$) and group B (before treatment, 12.22×10^3 ; after treatment, 6.8×10^3 ; $P = 0.028$), with no significant differences between treatment groups.

Conclusions: The technique using the papain-based gel was effective in the chemomechanical removal of caries.

P31-554

In-vivo evaluation of Diagnodent for detection and quantification of occlusal caries in permanent molars

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Background: Diagnosis of non-overt occlusal decay is challenging and can be highly subjective, and its inherited uncertainties can lead to widely differing treatment decisions.

Aim: The study aimed to evaluate the utility of the laser fluorescence device DIAGNOdent as a tool for occlusal caries diagnosis in Sudanese children.

Design: A total of 223 first and second permanent molar teeth of children (age 9–12 years) attending paediatric clinic, Faculty of Dentistry, Khartoum University were examined for detection of carious lesions on macroscopically intact occlusal surfaces. The teeth were cleaned and occlusal carious status was recorded using both visual examination and DIAGNOdent device. Cavity depth was used as gold standard. Kappa values for intra-examiner reproducibility were calculated and Logistic regression analysis was performed to determine the sensitivity and specificity of the diagnostic methods. The statistical significant was set at P value < 0.05 .

Results: Good intra-examiner reproducibility for visual examination and DIAGNOdent was found (Kappa 0.96 and 0.72) respectively. Logistic regression showed that the performance of the DIAGNOdent device was highly sensitive and the performance of the visual inspection was more specific. Pearson correlation test showed positive correlation ($r = +0.72$) between the measurements of DIAGNOdent device and the clinical lesion depth at 99% confidence interval ($P < 0.01$). The correlation of DIAGNOdent measurements with clinical lesion depth was better than that with visual examination ($r = +0.49$).

Conclusions: DIAGNOdent could be used as a valuable adjunct with visual inspection in occlusal caries diagnosis in this group of Sudanese children.

P31-555

Cariogenicity of fruit drinks: investigation using experimental ratsA. AL-JOBAIR¹ & R. KHOUNGANIAN²¹*Department of Paediatric Dentistry and Orthodontics, College of Dentistry, King Saud University, Riyadh, Saudi Arabia;*²*Department of Oral Medicine and Diagnostic Sciences, College of Dentistry, King Saud University, Riyadh, Saudi Arabia*

Background: Fruit drinks are mostly water with high amount of added sugar, citric acid, artificial colors and flavors. Among those people who provide fruit drinks to children, there seems to be an opinion that these drinks are healthier than other acidic drink and less harmful to the teeth.

Aim: To test the cariogenicity of different fruit drinks using a rat caries model.

Design: After the approval of the Ethical Committee at the College of Dentistry Research Centre, King Saud University, fifty Sprague-Dawley rats were infected orally at the age of 22 days with active growing culture of *Streptococcus mutans*. They were divided into 5 groups according to the offered tested drink namely 10% sucrose (positive control), apple fruit drink, orange fruit drink, mango fruit drink, and distilled water (negative control). The weight of the rats and the amount of drinks consumed were registered weekly. Total sugar analysis was performed using high performance liquid chromatograph (HPLC). At the end of the fifth week, the rats were sacrificed using ether. After the dissection of mandible and maxilla, molar caries were scored under stereomicroscope by using Keyes' method. The data were analyzed using ANOVA and Tukey-Kamer tests.

Results: Rats consuming different fruit drinks developed significantly higher sulcal and smooth surface caries scores than those consuming distilled water ($P < 0.05$). However, they developed almost the same sulcal and smooth surface caries scores as 10% sucrose group.

Conclusion: The cariogenic load of fruit drinks is high and their frequent consumption should be discouraged.

P31-556

The effect of toothpaste and tooth mineralization products on morphology of human enamelP. BRADNA¹, R. VRBOVÁ¹, V. FIALOVÁ¹, D. HOŠOVÁ¹ & J. HANDZEL²¹*Institute of Dental Research, Czech Republic; ²Stomatological Clinic, 1st Faculty of Medicine & General Faculty Hospital, Charles University, Prague, Czech Republic*

Background: The remineralization of initial enamel caries lesions is the basis of healing process of this infectious disease.

Aim: To investigate changes in morphology of artificially created human enamel defects after application of toothpastes with various fluoride ions content or calcium phosphate mineralization products.

Design: In the study were used toothpastes Stoma Paradentol, Vademecum Titan Strong, Signal Cavity Protection, ELMEX Sensitive, ELMEX for children, SensiShield and ODOL Herbal Gel; from tooth mineralization products the Enamel Care, the GC Tooth Mousse and a CaP gel (agent under development) were examined. Products were applied on polished enamel with artificial defects of approximately 150 µm in length prepared using a Knoop hardness indenter. Enamel was brushed with the toothpastes and CaP gel for 1 min and then stored in the artificial saliva. Tooth Mousse was applied for 4 min. Morphology of enamel surface during 30 applications of each product was investigated using optical and scanning electron microscopy.

Results: After application of toothpastes with high fluoride content or the Tooth Mousse no changes in enamel structure or in defect shape were observed. With Stoma Paradentol and SensiShield, however, strong abrasion deterioration of enamel surface was found. On the other hand after application of Enamel Care or CaP gel the enamel surface was covered with a layer of mineral deposits filling up artificial defects.

Conclusions: These results suggest different protective effect of the tested materials which will be investigated in the following research.

P31-557

Traction of second premolar by application of band-loop space maintainer in autism children

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Introduction: Autistic individual have impaired intellectual development, atypical repetitive behaviour and hypersensitivity and tend to dislike changes in his environment. Therefore, the dentists often have to consider special needs in their dental treatments. An autistic child whose right second premolar in his mandibular needed to be erupted by traction had come to our clinic. We thought that a smaller appliance may be useful for this children and applied band-loop space maintainer in traction of his tooth.

Case report: A Japanese boy with autism had been referred to the Clinic of Pediatric dentistry at Nagasaki University Hospital for dental caries treatment and prevention. At 11 years 9 months of age, orthopantomography revealed that his right second premolar in mandibular was slanted toward the root of permanent first molar. His second primary molar was extracted and fenestration was performed under general anesthesia. Then, a band-loop space maintainer was set. After 4 months, a hook was fitted on the tip of the loop. His second premolar was uprighted and erupted using orthodontic elastics.

Comments: In the present case, his acceptance of this appliance was good since he had experience of the space maintenance by band-loop space maintainer and it was enough small for him to approve. His second premolar was successfully erupted after appliance wearing in approximately one year. The appliance in the present report is useful for traction of second premolar in such a case.

P31-558

Prevalence of incipient caries lesions after different topical remineralization treatments in children six years-old

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Background: Casein phosphopeptide amorphous calcium phosphate nanocomplexes (CPP-ACP) have been shown anticariogenic potential in laboratory, animal, and human *in situ* experiments so it's important to know their impact in preventive pediatric programs.

Aim: To evaluate the effectiveness of the topical application of different remineralization treatments on the prevalence of incipient caries lesions.

Design: A clinical trial was performed which randomly 120 school children, six years-old in three groups. The scholars received different topical treatments: sodium fluoride, CPP-ACP and placebo every 2 weeks for 6 months. The clinical examination was carried out by one observer previously standardized on the criteria of the international Caries Detection Assessment System, (ICDAS II) before and after the preventive intervention. Kruskal Wallis test was used for comparison of the groups.

Results: One thousand six hundred and sixty four teeth were included. There were not significantly differences between groups that received fluoride or CCP-ACP treatments ($P > 0.05$), but the incipient caries lesion of the children of placebo group were higher ($P < 0.05$).

Conclusion: Topical application of CCP-ACP decreased the incidence of incipient caries lesions of enamel, perhaps further studies with a longer term observations are required.

P31-559

Comparative evaluation of Streptococcus sobrinus and serotypes of Streptococcus mutans in children with severe early childhood caries and caries-free using serotype-specific PCR

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Background: SECC (severe early childhood caries) is the destructive form of tooth decay in children, produced by *Streptococcus mutans*.

Aim: The aim of this study was to determine implication of different serotypes of mutans and sobrinus in caries susceptibility of children's teeth.

Design: In this study, distribution of serotypes of *Streptococcus mutans* and *sobrinus* was evaluated in two groups of 38 children (18 SECC and 20 CF), 3–5 years old in an orphanage.

After sample collection and processing, DNA of plaque samples were extracted and concentrated, and the presence or absence of *S. sobrinus*, *S. mutans* and mutans serotypes were determined by PCR-based method. Fisher's exact test was used for statistical analysis (P -value < 0.05).

Results: (i) Contamination with mutans was shown in 83.3% SECC and 90% CF groups.- Percentage of multiple contamination to mutans serotypes in the SECC and CF were 73.3% and 50% respectively.- The most frequent serotype in both group was the serotype c (83.3% SECC and 77.7% CF). (ii) The percentage of contamination with *sobrinus* in the SECC and CF were 27.7% and 15% respectively. (iii) The percentage of mix contamination with *mutans* and *sobrinus* in the SECC and CF groups were 27.7% and 10% respectively.

Conclusion: According to this research the presence of mutans can't be used as the only factor for predicting caries activity. Furthermore, possibly the difference in caries experience in groups can not be solely limited to serotypes and microbial species and other exogenous and endogenous factors would be of great importance.

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P32-560

Comparison of two computerized anaesthesia delivery systems: pain and pain-related behaviour in children during a dental injection

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Background: There is a constant search for ways to avoid the invasive and often painful nature of the local injection of anaesthesia before starting the dental procedure. Two new systems developed to address the shortcomings of the traditional dental syringes are computer systems: the Sleeper One® and the WAND®. **Aim:** The purpose of this study was to investigate whether there is a difference in reaction of the children when using the Sleeper One® compared to the WAND®.

Design: This randomized controlled study was conducted among 100 children (mean age 5 years and 5 months, SD 9 months). All children needed at least one dental visit using local anaesthesia. Each child was randomly assigned to either the Sleeper One® or the WAND®.

Results: During treatment, children expressed the same amount of disruptive behavior using the Sleeper One® or the WAND® (Mann Whitney U, $P > 0.05$). The average injection time of the Sleeper One® (mean 2.50 min, SD 0.58) is significantly shorter than that of the WAND® (mean 3.20 min, SD 0.57; Kruskal-Wallis test, $P < 0.05$).

Conclusions: Although there is no significant difference in the reaction of the child using the Sleeper One® or the WAND®, the use of the Sleeper One® might be preferred over the WAND® for two reasons. Since the average time of the Sleeper One® is shorter, the disruptive behavior lasts less. Second, all dentists participating in this study preferred the use of the Sleeper One®, that which seemed to be more user-friendly than the WAND®.

P32-561

Satisfaction of recently-trained German dentists and their patients with dental care under nitrous oxide sedation

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Background: In Germany there is a renewed interest in dentist-led nitrous-oxide (N₂O) sedation.

Aim: To determine patient satisfaction with treatment under N₂O sedation and evaluate dentists' perspectives on sedation success.

Methods: Five dentists who had received 16 h of post-graduate training in N₂O sedation during the previous year recommended N₂O sedation to 39 patients. Thirty two ASA I patients were treated (age = 8–15 years; treatment duration = 45–60 min) and N₂O sedation was administered using a Biewer Medical Sedaflow System with an Accutron Digital Ultra PC Flowmeter. N₂O concentration was titrated to effect, with a maximum of 70% N₂O.

Sedation level was recorded every 5 min using the Brietkopf and Buttner classification. Overall behavior and treatment outcome were rated using the Houpt Behaviour Rating Scale¹. Patients were asked if they would choose N₂O sedation in the future.

Results: The maximum sedation score was 2 in 30/32 patients (94%) and 3 in 2/32 patients (6%). On the Houpt Behaviour Rating Scale 22/32 patients (69%) achieved a 6 (excellent), 4/32 (13%) achieved a 5 (very good), 3/32 (9%) achieved a 4 (good), 2/32 (6%) achieved a 3 (fair), and 1/32 (3%) achieved a 1 (treatment terminated prematurely). When asked if they would choose N₂O sedation again 26/32 (81%) said 'yes', 4/32 (13%) were undecided and 2/32 (6%) said 'no'.

Conclusions: Most patients were positive for N₂O sedation when recommended by their dentist. Dentists rated the quality of their care highly when N₂O was employed. Patients reported high levels of treatment satisfaction and most would ask for N₂O sedation in the future.

P32-562

Routine dental treatment with articaine 4% plus 1:400 000 epinephrine in children

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Background: Local anaesthesia plays a crucial role in pain management in paediatric dentistry. Body weight based dosage and use of a vasoconstrictor are recommended to reduce the risk of intoxication. The vasoconstrictor of choice in most cases is epinephrine.

Aim: An articaine solution with reduced epinephrine concentration should be tested in dental practice. Efficacy and tolerance of the drug were criteria as well as side effects and duration of anaesthesia (especially soft tissue).

Design: In a no interventional study we performed routine dental treatment (e.g. filling, extraction, endodontics, crown preparation) in children aged 4 to 18 years. For local anaesthesia articaine 4% + epinephrine 1:400 000 was used in adequate technique chosen by the dentist.

Results: Nine hundred ninety nine patients (50.5% male, 49.5% female) with a mean age of 7.9 (SD 2.34) years were treated. In 93.5% of cases the initial local anaesthesia was sufficient to perform the planned treatment. A second injection was necessary in 3.4% before and 2.7% during and in 0.4% at both times. The mean volume was 1.5 mL (SD 0.69), the additional volume 0.9 mL (SD 0.46). The major technique was infiltration (50.2%), followed by a combination with PDL (25.8%) and block anaesthesia (14.3%). The mean treatment time was 15 min (SD 10). Side effects occurred in 4.3% of patients, a possible or likely coherence with the solution was stated in 3.1%.

Conclusions: The articaine 4% solution with the reduced epinephrine concentration (1:400 000) is a safe and suitable drug in paediatric dentistry for routine treatment.

P32-563

General anesthesia in paediatric dentistry and special care

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Background: Some patients are not cooperating for their dental care and sometimes the conscious sedation is not sufficient. In this situation, the ultimate possibility is to propose general anesthesia in order to perform the necessary dental treatment.

Aim: The aim of the present study is to analyze the population of the patients treated under general anesthesia and to record the different treatments procedures performed during the intervention.

Design: This retrospective study evaluated the general situation and the follow up of the patient. Evaluation of the treatment performed under general anesthesia was also done. Data were recorded between 2005 and 2010 in the department of Paediatric Dentistry and Dental Care for Disabled Persons of the Saint-Luc Clinical University in Brussels. It concerns a total of 1172 patients and 7930 dental care. The age of the patients ranged from 1 to 80 years. The dental procedures performed included caries restorations, pulpotomy, root canal therapy and dental extraction.

Results: The findings of this study suggest that, in our department, general anesthesia is mostly used for young children with extensive dental problems. Most of them are girls. It also plays an important role in the facilitation of dental treatment of patients with special needs.

Conclusions: Providing treatment under general anesthesia for individuals with chronic illness, disability or behavior problems, who are not cooperative, may improve their dental health and allow us to have after treatment a better maintenance of their oral health.

P32-564

Bispectral index as a guide for titration of anesthetic use during deep sedation among paediatric patients

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Aim: The aim of this study was to compare the total medicament doses and recovery profiles of patients for who BIS was used to monitor sedation.

Design: Thirty-four healthy pediatric patients aged 3–10 years who applied to the Ankara University Faculty of Dentistry, Department of Pedodontics for dental treatment were enrolled in the study. Patients were randomly divided into two groups of 17 patients each. In one group (BIS Group), drugs were administered to maintain patients' BIS values between 60–70, while the other

group (Control Group) was not monitored using BIS. Children's behavior and condition were assessed using the *Frankl Scale*, *Houpt Behavior Rating Scale*, *Modified Steward Coma Scale*, *Michigan University Sedation Scale* and *Modified Wilton Scale*. Statistical analysis was performed using SPSS 17.0 for Windows. Data was evaluated by *Chi-square*, *Student's t* and *Pearson's correlation* tests.

Results: Although significant differences were found in the numbers of patients receiving remifentanyl in each group, no significant differences were found in the anesthetic doses between groups. Statistically significant differences were observed in muscle activity, involuntary movement and *Steward Coma Scale* values (for all subgroups). Although the recovery period was longer in the Control Group than in the BIS Group, the difference between the two was not statistically significant.

Conclusions: The BIS monitor can be used as a safety guide for physicians to ensure effective titration of anesthetic drugs and minimize the side effects and recovery time during deep sedation among children.

P32-565

An effective pathway for managing paediatric dental patients during general anaesthetic waiting periods

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Background: Paediatric patients requiring multiple restorations and extractions often require treatment under a general anaesthetic. Demand for treatment under general anaesthetics (GA) is increasing rapidly resulting in lengthy waiting periods especially in public hospitals. Often there is little or no contact with the child during waiting periods. The clinical situation usually worsens resulting in increased demand for emergency services. Parents often get upset due to the lack of any intervention or contact during waiting periods resulting in increased complaints.

Aim: Stabilisation and slowing down progression of dental caries during general anaesthetic waiting periods and reduce repeat GA treatments.

Design: Patients assessed and placed on a waiting list for treatment under GA were seen by a dietician for dietary counseling, and a dental therapist for oral hygiene instructions and caries stabilization. Post GA appointments were given to all patients and diet, oral hygiene were reviewed. Patients were then offered regular recalls either in the dental hospital or local community clinic.

Results: Reduced need for emergency management during waiting periods, fewer complaints from parents and low percentage of repeat treatments under general anaesthetic were noted.

Conclusions: The pathway to oral health strategy used by Sydney Dental Hospital is an effective way to manage children on GA waiting lists. This pathway has produced better clinical outcomes including slower progression of caries and low rates of repeat treatments.

P32-566

GA needs for dental treatment in patients with medical condition

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*Paediatric Dentistry Department, Carol Davila University, Bucharest, Romania***Background:** Children with special needs often undergo GA for dental treatment.**Aim:** To determine the prevalence of patients with medical condition that have requested and required dental treatment under GA in the Paediatric Dentistry Department from Bucharest.**Design:** A retrospective study was conducted. Dental records of patients aged 2–29 years examined and treated by one dentist (TM) between 2007 and 2010 along with other medical records which confirmed the general condition, were gathered and processed. Records included the following data: identification, diagnosis of diseases (dental and general), dental treatment needs and need for GA.**Results:** Of the 1198 patients examined (603 males), 131 (mean age 9.31 ± 5.3 ; median 8.00) had one or more general diseases known and declared. Frequency distribution by type of disease: neuropsychiatric diseases (36%), allergies (16.8%), infectious diseases (10.7%) and other (36%). Sixteen patients (12.2%) with general diseases (mean age 8.33 ± 5.1 ; median 7.00) required dental treatment under GA. Of these 44% were aged less than 6 years and 22% were aged between 6–9 years. Most patients who required GA had neurological disorders, such as: mental retardation (62.5%), oligophrenia (18.7%), autism (12.5%), ADHD (6.2%).**Conclusions:** 10.9% from the examined patients had medical condition and only 12.2% of them required dental treatment under GA, predominantly patients with neuropsychiatric disorders. Patients with Down syndrome allowed themselves to be treated under common circumstances with/without local anaesthesia.

P32-567

Saliva cortisol levels, relationship with dental anxiety and factors that affect them, in childrenK. YFANTI¹, D. EMMANOUIL¹, L. PAPAGIANNOULIS¹ & E. KITRAKI²¹*Department of Paediatric Dentistry, Dental School, University of Athens, Greece;* ²*Department of Basic and Biomedical Sciences, Dental School, University of Athens, Greece***Background:** Dental anxiety is still a problem for young patients, despite advances in treatment and behavior management. An easy way to assess dental anxiety in children is self report questionnaires. Measurement of saliva cortisol is considered a reliable, non-invasive method to determine the neuroendocrine system's activity.**Aim:** To investigate, in children, the status of hypothalamic-pituitary-adrenal axis activation, at a dentist's versus. home environment, in parallel with their anxiety levels and oral health factors that may affect them.**Design:** Fifty two children (26 girls, 26 boys), 8–10 years old, with different degrees of caries were studied. Saliva samples were collected prior and after dental examination, as well as in the next morning (home) and at recall visit. The validated Greek version of CFSS-DS questionnaire was completed by the children and DMFT/dmft scores were used for estimation of caries' degree.**Results:** The results confirmed the presence of a circadian cortisol secretion in children. Boys had higher saliva cortisol than females after initial dental treatment. Girls tended to have more dental anxiety than boys. Anxious girls had increased levels of saliva cortisol, especially at the recall. A correlation of CFSS-DS and cortisol levels was found. Boys with caries had increased cortisol levels after dental treatment. The effect of caries' degree on dental anxiety was significant only for boys.**Conclusions:** Cortisol saliva is a reliable index of dental anxiety as confirmed with CFSS-DS questionnaire. The increased incidence of caries is compatible with increased dental anxiety.

P32-568

Dental anxiety and health-related quality of life of children aged 11 to 14 years with orthodontic malformationsA. RESHITAJ¹, S. KRASNIQI¹ & N. IBISHI²¹*University Clinical Center of Kosova, Dental Clinic, Prishtine, Kosovo;* ²*University Clinical Center of Kosova, Clinic of Psychiatry, Prishtine, Kosovo***Background:** Oral disease has considerable impact on quality of life and behavioral problems.**Aim:** This study was to assess the level of dental anxiety and health related quality of life of children aged between 11–14 years old with orthodontic malformations.**Methodology:** Ninety two children with orthodontic malformations were compared with 35 children with dental caries. The Corah Dental Anxiety Scale and Child Perception Questionnaire (short form) were used. General information was obtained by the parents.**Results:** The orthodontic group had lower level of anxiety with mean scores 8.86 ± 2.78 than the dental group with mean scores 10.80 ± 2.75 . The differences did not show significant differences ($t=3.530$, $P < 0.001$). The orthodontic group according CPQ reported more frequently about impact of their oral condition on their life overall 39.1% and emotional well being 47.8%. The groups did not differ on oral symptoms, functional limitations and social well being. 59.8 % of parents in orthodontic group and 88.6% in dental group reported about negative emotional experiences of their children during treatment procedures.**Conclusion:** Significant differences between groups on level of anxiety and few differences between groups on Oral HRQL suggests that the majority of children with orthodontic malformations are well adjusted and able to cope with the adversities they experience as a result of their conditions. The high reported frequency of child negative emotional experience should be the basis for the development of oral health programme in our country in order to establish better behavioural management strategies.

P32-569

Hypnosis in treatment of children with fear of dental treatment

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Background: Children with fear of dental treatment have difficulties to accept conventional dental treatment. Often treatment in general anesthesia may be the only solution for their management problems.

Aim: To investigate if hypnosis can be used for children who are unable to accept conventional dental treatment due to their dental fear.

Design: A retrospective study of thirty-nine children aged 5–17 years (mean 12.5 ± 0.6) in whom conventional treatment had been given up. A dentist with special training in hypnosis performed the treatment in hypnosis. The children expressed fear of pain during treatment, the sound of the drilling, injections, and reported to have these problems in average for 5.4 ± 0.8 (SEM) years. The children were trained in hypnosis using guided visualization. Systematic desensibilization was also performed in hypnosis. Children's psychological resources were developed in hypnosis as well as anxiety manipulation. The children had in average two 1-h sessions (range 1–4) with hypnosis and 2.4 (range 1–8) dental treatments in hypnosis depending on their dental needs.

Results: Thirty-four children (87%) completed the dental treatment and see a dentist on a regularly basis. Among these children 20 (59%) returned to their usual dentist and fourteen (41%) continued with the dentist trained in hypnosis.

Conclusions: Can be very effective to treat children with fear of dental treatment. It may be cost effective seen in longer period of time since this treatment seems to heal the children's fear whereas treatment in general anesthesia only solves the dental problems.

P32-570

Relation of parental dental anxiety and child personality characteristics with dental anxiety of children aged between 6 and 12 years

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Background: Children's preoperative anxiety is an important issue, for patient cooperation for dental treatment. Child personality together with parental dental attitude are considered significant factors affecting child's dental anxiety.

Aim: The aim of this study is to evaluate the effect of parental dental anxiety and child personality characteristics on dental anxiety of children aged between 6 to 12 years.

Design: In this study 47 randomly selected children were asked to complete the Child Version of Parental Acceptance-Rejection Questionnaire (PARQ) and were evaluated for childhood dental anxiety using the Facial Image Scale (FIS). The parents of the children also completed Corah's Dental Anxiety Scale (DAS) for themselves and Strengths and Difficulties Questionnaire (SDQ) for their children. Student t-test, Pearson correlation analysis, Spearman's Rho correlation analysis were used for statistical analysis.

Results: Our results showed that no statistically significant correlations were found for parental-child dental anxiety relations, parental acceptance-rejection and child's dental anxiety, strength and difficulties of the children with low and high parental dental anxiety ($P > 0.05$).

Conclusion: More studies are needed to evaluate the relation of children's dental anxiety with parental dental anxiety and children's personality characteristics.

P32-571

Humanitarian dental relief operation in remote villages in Vietnam 2011

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Introduction: DDS4Kids is a humanitarian dental relief organization based in the USA, founded by Dr. Lan Jones, a refugee from Vietnam. For over 15 years Dr. Jones organizes yearly dental operation trips and leads dental teams to provide dental treatment and basic health education to thousands of children in elementary schools in remote villages of Vietnam, where basic dental care is nonexistent. The operation takes 2 weeks where the team travels from school to school in coordination with the local government, the ministry of education, the health department, and the Vietnam Red Cross organization. The short term goal is to provide emergency dental care to relief pain and suffering experienced by the majority of the school children. The long term goal is to empower the local communities through health education so they can help themselves, positively improve their own dental health, their total health, and thus change their own future.

Participants: (i) Eight Dentists from USA, Canada, England, Germany, Vietnam and Israel. (ii) Two paramedical staff from USA and Israel. (iii) Twenty-one Local Vietnamese volunteers. (iv) Ten Red Cross staff-8 elementary schools were visited, children ages were 6–12 year. Approximately 5000 children were screened, of which 1500 had preventive cleaning and fluoride applications, 1000 children were treated – most had multiple extractions in 2–4 quadrants. One thousand three hundred families with children under 5 in 12 villages of three different provinces attended the health education sessions. All received a gift package of dental education hand-out, toothbrushes, toothpaste, towel, soap, and a blanket. Sixty-two handicapped children also attended the health session, received the home care gift package in addition to a small monetary gift.

Comments: Two children out of 5000 were found to be previously treated, simple filling – one in each child were done by dental nurses. For the majority of children, there was no previous dental experience and probably won't see a dentist in their childhood. The immediate change in quality of life for these children in eliminating severe sources of pain and infection is unmeasurable.

P32-572

Resolving gingival overgrowth in a pediatric patient with hemolymphangioma in the lower jaw using laser NdYAG

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Introduction: This is a presentation of a pediatric patient, with hemolymphangioma who underwent gingivectomy/gingivoplasty with the application of laser NdYAG. NdYAG laser is a useful surgical tool, characterized by several advantages over conventional methods. These advantages make it the first choice in certain cases of pediatric patients.

Case report: A 17-year old patient with hemolymphangioma in the lower jaw and neck, developed gingival overgrowth during orthodontic therapy and referred for therapy at the postgraduate clinic of periodontology of the University of Athens. The patient underwent gingivectomy/gingivoplasty due to functional and esthetic reasons. The excision of the hyperplastic gingival tissue

was accomplished with the application of laser NdYAG (Power: 2.4 W, frequency: 60 Hz, Energy: 40 mJ). Photographic material will be present step by step the surgical procedures as well as the healing during the following months.

Comments: The contribution of NdYAG laser is very useful in eliminating gingival overgrowth in pediatric patients, especially in case of a complicated medical history. Laser assisted surgical procedure is well tolerated by pediatric patient, reducing the post-surgical discomfort, eliminating intra-surgical bleeding and reducing total time of therapy.

P32-573

Hypophosphatasia and prepubertal periodontitis. Case Report of a patient's follow up of 20 years

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Introduction: Hypophosphatasia in young children results in early tooth loss especially of the front ones. This loss is attributed to qualitative and quantitative changes of the cementum. Periodontal lesions are not proportional to the presence of dental plaque. Often the erupted permanent teeth have hypoplastic enamel and/or dentin and disturbances in the growth rate of the crestal bone.

Case report: A girl of 3 years of age was referred for consultation due to the loss of the deciduous bottom central incisor, mobility and movement of the deciduous top central incisor. Clinical examination revealed periodontal lesions in the deciduous dentition whereas the presence of dental plaque was minimal. After the diagnosis of prepubertal periodontitis the child underwent further medical examination for medical conditions which manifest this type of periodontal disease. The child was diagnosed with hypophosphatasia, signifying that often dental and periodontal lesions can precede biochemical changes of the disease. The young child underwent non surgical periodontal treatment and followed a strict periodontal therapy maintenance program every 3 months. During the 20 years of periodontal therapy maintenance program the permanent teeth erupted, only few of them showed signs of hypoplastic enamel, but no signs of periodontal disease were evident. Up to the present date the patient has a healthy periodontium and is on a periodontal therapy maintenance program every 6 months.

Comments: The loss of a deciduous tooth deserves thorough examination since in a number of cases the co-existence of localized or generalized prepubertal periodontitis is a valuable indicator for the presence of systemic disease.

P32-574

Treatment protocol in high caries risk adolescents

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Introduction: Dental caries is still a common disease among adolescents. It is a common finding young adolescent of high caries risk having more than one site of incipient caries, described as 'white spots', especially after the orthodontic treatment. At this stage it is very important for the clinician to understand that the main goal is to prevent new lesions on existing sound surfaces, along with extension of old ones into cavities and to remineralize existing cavitated and non-cavitated lesions. In the preventive strategies the role of the clinician is to advise, educate and encourage behavioral change in these patients.

When cavities have occurred the clinician should remove the carious lesion and fill the cavity mainly in order to aid plaque control. Also, patients should be on a follow-up and maintenance program with the frequency dictated by individual need.

Case report: The aim of this study is to present the caries management at high risk young adolescences. In this case report, the clinical procedure of dental management of four high caries risk adolescent patients that came in the clinic of Operative Dentistry, School of dentistry, University of Athens, is presented. The goal of this caries management strategy is to arrest and remineralize early lesions and includes consideration of the patient at risk, the status of each individual lesion, patient management, clinical management, and monitoring.

Comments: It is important to realize that on an individual patient basis there is great variation in the complex interplay between aspects involved in caries lesion development. Especially for adolescents extra care should be given in patient education in preventing measures, alongside with operative treatment, when necessary.

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