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Oral Session O17 – Endodontics

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Oral Session O17/Endodontics

O17-124

Radiographic changes associated with pulp-infection in primary incisors

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Introduction: It is important to early diagnose and treat pulp-infection in primary teeth in order to prevent developmental-disturbances in the correspondent permanent tooth-buds (CPTB). However, pulp infection may exist also without a definite clinical sign. The aim of the present study was to identify independent radiographic variables associated with presence of pulp-infection.

Patients and methods: The study consisted of 183 patients with periapical radiographs of primary upper incisors, in whom 97 had a fistula. The patients were retrospectively identified and analyzed. The Ethics Committee of Tel-Aviv University approved the study. Univariate and multivariate logistic regression analysis (SPSS) were used to identify radiograph-variables associated with pulp-infection.

Results: A fistula was present in 81% of the teeth with inflammatory external root resorption (IERR, $P < 0.0001$), 66.7% of the teeth with pulp pathology ($P < 0.0001$), 77.5% of the teeth with deep caries ($P < 0.0001$), 68.7% of teeth with past traumatic injury ($P < 0.0001$), 70.8% of teeth with enlargement of the dental sac (Eds, $P < 0.0001$), 77.5% of teeth with loss of lamina dura of the dental sac (LLDds) and in 75.7% of teeth with increased radiolucency of the dental sac (IRds) of the of CPTB (Odd Ratio: 29.3, 16.9, 5.6, 3.3, 7.1, 13, 16, respectively). In multivariate logistic regression four variables were independently associated with present of fistula: IERR ($P < 0.0001$), pulp pathology ($P = 0.006$), LLDds ($P = 0.001$) and IRds of the CPTB ($P = 0.005$) (Odd Ratio 24.8, 10.8, 5.9 and 4, respectively).

Conclusion: Primary incisors with radiographic evidence of IERR, pulp pathology, LLDds and/or IRds of the of CPTB may be treated as infected-teeth.

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Effectiveness of German chamomile, MTAD and sodium hypochlorite irrigants on smear layer

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Introduction: Endodontic success depends heavily on effective chemo mechanical debridement of the root canal through the use of instruments and irrigating solutions. Irrigation is an important adjunct, which facilitates cleaning of root canal system by flushing debris as well as serves as bactericidal agent, tissue solvent and lubricant. The aim of this study was to compare the effectiveness of German chamomile extract, MTAD- [mixture of tetracycline, acid and detergent] and 2.5% sodium hypochlorite solution [NaOCl] as intracanal irrigant for removal of the smear layer.

Materials and methods: Thirty extracted, single rooted, primary, human teeth were allocated at random into three experimental groups of ten teeth, for each tooth, the pulp chamber was accessed and all the canals were enlarged using K-type files using step back technique, the apical stop was prepared to a size 30. The canal was subsequently irrigated with above mentioned solutions. Each tooth was split longitudinally and prepared for examination by scanning electron microscopy [SEM].

Results: The most effective result in removal of smear layer occurred with the use of MTAD, followed by the use of German chamomile extract. German chamomile extract was found to be significantly more effective than 2.5% NaOCl solution which has only minor effects. Better cleaning was found in the cervical and middle thirds for all groups with the worst in the apical third.

Conclusion: The efficacy of chamomile to remove smear layer was superior to 2.5% NaOCl alone, but less than MTAD mixture.

O17-126

MTA produces superior outcomes in vital primary molar pulpotomy

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Introduction: The objective of this study was to investigate the outcomes of vital primary molar pulpotomy in which there is no direct contact between eugenol and the vital pulp. Four pulpotomy techniques were compared: ferric sulfate (FS) pulpotomy, eugenol-free FS pulpotomy, mineral trioxide aggregate (MTA) pulpotomy and FS/MTA pulpotomy.

Materials and methods: The pulpotomy technique assigned to each molar was determined by random selection. Two blinded, disinterested raters classified each molar into 1 of 3 radiographic outcomes: (1) N-normal molar without pathologic change; (2) P_o-pathologic change present, follow-up recommended; (3) P_x-pathologic change present, extraction indicated. Logistic regression and survival analysis were used to compare outcomes of molars treated with each pulpotomy technique. The Research Ethics Board at The Hospital for Sick Children approved this investigation and subjects (or guardians) gave written informed consent.

Results: A total of 92 patients (mean age = 47.2 months) with 227 pulpotomy-treated molars returned for at least 1 recall examination. Median follow-up for molars was 24 months (range: 12–38 months). MTA molars demonstrated significantly fewer P_x radiographic outcomes than FS molars ($P = 0.002$, χ^2). Eugenol-free FS molars demonstrated significantly more P_x radiographic outcomes than MTA ($P < 0.0001$, χ^2) or FS/MTA ($P = 0.002$, χ^2) molars. Significantly lower survival was demonstrated for eugenol-free FS molars compared to MTA molars ($P = 0.02$, log-rank test) over 6–38 months.

Conclusion: Outcomes for MTA pulpotomy were superior to FS and eugenol-free FS pulpotomy after a median follow-up of 2 years.

O17-127

Investigation of one-visit endodontic therapy for children with acute periradicular periodontitis

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Introduction: To explore the possibility of delivering one-visit endodontic therapy to children suffering from acute periradicular periodontitis by mainly comparing the clinic outcomes with those achieved through multiple-visit module popular in China today.

Patients and methods: Permission was obtained from the institutional ethical committee for the study. 80 children, aged 2 to 7, diagnosed with at least one acute periradicular periodontitis were invited to take part in this study. Their caregivers signed the informed consent. Pre-operative radiographs were taken to determine if endodontic management was necessary. Being randomly assigned, 40 kids were given one-visit endodontic therapy while the rest were treated with multiple-visit module. Postoperative flare-ups such as immediate pain and swelling were recorded. Time for operating procedure and relieving of the symptoms was compared between the two groups. The patients were followed up for 6–20 months. The data were processed by SPSS software.

Results: Of the 40 children receiving one-visit endodontic therapy, one had a serious postoperative pain and withdrew from the test group. 4 children complained of immediate pain which did not make them change the treatment plan. Time for one-visit procedure was two to three times longer than that for each visit in traditional group, however, the overall time consumed by the patients in the test group was much less. Time for relieving acute symptoms was also shorter in the test group. All clinical outcomes from the two groups were not statistically different ($P > 0.05$).

Conclusion: One-visit endodontic therapy may be carried out successfully for children with acute periradicular periodontitis.

O17-128

Pulpotomy in primary teeth using ferric sulfate and mineral trioxide aggregateM. MUELLER¹, S. A. BENZINGER² & H. J. M. VAN WAES²

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Introduction: The objective of this retrospective study was to evaluate the clinical and radiographic success rate of pulpotomies in carious primary teeth using ferric sulfate for hemostasis and mineral trioxide aggregate (MTA) as pulp dressing material.

Materials and methods: The study population consisted of children treated under general anesthesia at the Children's Hospital of Zurich. Of all dental treatments between June 2003 and March 2005, patient charts were screened for pulpotomies using ferric sulfate and MTA. The restorations included stainless steel crowns and composite resin. 108 teeth were available for clinical follow-up with a mean follow-up time of 13 months. 53 teeth were also radiographically reviewed with a mean follow-up time of 13.4 months. The data was statistically analyzed using the program StatView 5.0.1. Kaplan-Meier plots were constructed to demonstrate graphically the clinical and radiographic survival over time.

Results: All 108 pulpotomies were clinically successful (100%). The radiographic success rate was 96.2% (51 of 53). Both failures showed pathologic external root resorption, one with additional furcation radiolucency. Discoloration of crowns with composite restorations appeared with the use of gray and white MTA.

Conclusions: With the described treatment protocol, including fast and complete achievement of hemostasis, both clinical and

radiographic success rates of MTA were very high and in accordance with previous studies. Since MTA is biocompatible and has the potential to induce formation of hard tissue, it can be recommended as biologic replacement to products containing formocresol or formaldehyde.

O17-129

Antibacterial efficacy of NaOCl/Biopure MTAD, diode laser and NaOCl/EDTA in primary molarsS. S. KUVVETLI¹, S. K. CILDIRI¹, E. CAGLAR¹, N. TOPCUOGLU² & N. SANDALLI¹

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Introduction: The objective of this study was to compare the antibacterial efficacy of irrigating with 1.3% NaOCl/Biopure MTAD and diode laser irradiation versus irrigation with 5.25% NaOCl / 15% EDTA in experimentally contaminated primary molar root canals in vitro.

Materials and methods: 75 root canals prepared from 25 extracted primary molar teeth were mechanically enlarged and the samples were randomly divided into 5 subgroups. The roots were inoculated with an overnight culture of *Enterococcus faecalis* in tryptic soy broth for 24 h. The root canals irradiated with diode laser and irrigated with 1.3% NaOCl/Biopure MTAD or 5.25% NaOCl/15% EDTA were experimental groups and untreated canals served as positive control group. The root canals in one group were inoculated with sterile TSB and served as negative control. Bacterial growth was analysed by counting viable *E. faecalis* on tryptic soy agar plates.

Results: The number of bacteria was significantly reduced in experimental groups in comparison with the positive control group ($P < 0.0001$). The difference between the antibacterial effect of 1.3% NaOCl/Biopure MTAD irrigation and diode laser irradiation was not significant ($P > 0.05$). 5.25% NaOCl/15% EDTA irrigation was found most effective. Although the number of bacteria found in the MTAD group was higher than the NaOCl/EDTA group, the difference was not significant ($P > 0.05$).

Conclusions: 1.3% NaOCl/Biopure MTAD irrigation and diode laser irradiation provided a significant antibacterial effect in contaminated primary molar root canals in vitro.

O17-130

Direct pulp capping with self etching adhesives in primary pig teethA. SHAYEGAN¹, M. PETEIN², R. ATASH¹ & A. VANDEN ABEELE¹

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Introduction: Calcium hydroxide has been the most frequently used material for direct pulp capping in permanent teeth as well as in deciduous teeth. However, its dissolution and lack of dentinal adhesion led scientists to seek new approaches, such as the potential of laser beams, MTA or adhesive systems as pulp-capping agents. The aim of the present study was to assess the response of the pulp of primary pig teeth after capping with four one-bottle self-etching contemporary adhesives versus calcium hydroxide.

Materials and methods: Fifty primary teeth from 3 healthy 4-month-old female pigs were used for the comparison between Futurabond DC (FB), iBond (iB), Adper Easy bond (AEB), Xeno V (XV) and calcium hydroxide (CH). The animals were

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sacrificed after 30 days and the jaw segments were prepared for histological examination. A statistical analysis consisted in Kruskal–Wallis and Dunn multiple comparison tests, performed using a Prism (version 3.0) software, with a level of significance set at $P < 0.05$.

Results: The presence of a calcified bridge was observed in 8 samples for direct pulp capping with the FB, iB and CH

groups, in 9 samples for the AEB group and in 5 samples for the XV group.

Conclusions: The results of the present histological study showed that, after 1 month and in noncarious pig teeth, there appears to be no significant difference between these one-bottle adhesives and CH in terms of hard tissue formation and pulp tissue preservation.

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