Dental Traumatology 2005; 21: 9–13

DENTAL TRAUMATOLOGY

Prevalence of oral trauma in children with bilateral clefts

da Silva JYB, Aranha AMF, Peixoto V, Costa B, Gomide MR. Prevalence of oral trauma in children with bilateral clefts. Dent Traumatol 2005; 21: 9–13. © Blackwell Munksgaard, 2005.

Abstract – The main object of this study is to analyze the prevalence of oral trauma in subjects with complete bilateral clefts, with anterior projection of the premaxilla. A total of 106 children aging 6 months to 9 years were analyzed. The caretakers answered a specific questionnaire, in order to report the presence or absence of trauma to the soft and/or hard tissues of the child's mouth. Whenever there was a history of trauma, the patients were submitted to clinical examination. The prevalence of oral trauma was 53%, being 91% of soft tissue lesions, 8.9% of avulsion, 7% of luxation and 1.8% of intrusion. For the males, the prevalence was 56% and for the females it was 47%, with no statistical significance. Regarding the following aspects: period of time spent with the parents and at school, and presence or absence of siblings, no statistical difference could be found. Among the traumatized individuals, 80% aged less than 3 years by the moment of the trauma, 89% suffered the trauma at home, 75% presented lesions in the soft tissue at the premaxilla, 16% in the maxillary incisors, and 8.9% presented lesions in both structures. It was noticed that 45% of the permanent incisors that succeeded the traumatized deciduous teeth presented alterations, being 48% of structure and 52% of structure and position. The prevalence of trauma in this sample was superior to that observed in the literature, without any positive associations between the evaluated aspects. These results suggest that the projection of the premaxilla brings about a higher risk of oral trauma around this area.

Juliana Yassue Barbosa da Silva, Andreza Maria Fabio Aranha, Virginia Peixoto, Beatriz Costa, Marcia Ribeiro Gomide

Hospital for Rehabilitation of Craniofacial Anomalies of the University of São Paulo (HRCA-USP), Bauru, SP, Brazil

Key words: child; cleft lip and palate; dental injuries; maxilla

Márcia Ribeiro Gomide, Setor de Odontopediatria, Rua Silvio Marchione 3-20, CEP: 17043-900, Bauru, São Paulo, Brazil
Tel.: +55 (14) 3235 8141
e-mail: magomide@yahoo.com.br

Accepted 15 October, 2003

The oral traumas have been a matter of increasing and considerable concern in dentistry, especially in pediatric dentistry. Despite of the large number of studies in the literature on its occurrence in the general population, this is not true for patients with cleft lip and palate. Besides evaluating the prevalence and main type of injury occurred, the studies on trauma on the deciduous dentition (1–14) provide information to the dentists about the identification and the need to follow up the probable sequels on the permanent succeeding teeth (15, 16).

In this period, the oral traumatisms are more frequent in children aging less than 3-year old (1, 3, 4, 10), as they are learning how to walk, therefore being more susceptible to falls and collisions with a number of objects (15–19).

Most of the dental injuries in children in the deciduous dentition take place at home (18–22), being the soft tissue lesions and the tooth displacement the most frequently observed injuries (3, 10, 12, 18, 21, 23, 24), with no significant differences between genders (1, 3, 10, 18, 25).

The occurrence of malformations in the permanent tooth after intrusion of the correspondent deciduous tooth (26, 27) may be a result of the elasticity and resiliency of the alveolar bone during the deciduous dentition (18, 24).

The teeth that are most affected by oral traumas are the maxillary incisors (1, 12, 13, 19, 22, 23, 25), especially the central incisors (1, 11, 13, 15, 17), without predominance of any side (1, 28).

In 1997, Lontra (29) studied the prevalence of oral trauma in the deciduous dentition in children with several types of cleft lip and/or palate, which was similar to that observed among non-cleft children (11, 30–32). Taking into account the anatomical feature of the bilateral cleft lip and palate, which is characterized by an anterior projection of the premaxilla (Figs 1 and 2), and considering that the increased maxillary overjet and proclination of teeth in individuals without clefts may jeopardize them to oral trauma (5), this study aimed at analyzing the prevalence of oral traumas among these patients, during the deciduous and mixed dentitions.

Material and methods

A total of 106 patients with complete bilateral cleft lip and palate were evaluated, of both genders, aging 6 months up to 9 years old, which were divided in three age groups (Table 1). All patients were regularly enrolled at the Hospital for Rehabilitation of Craniofacial Anomalies and attended the hospital for routine treatment at the Pediatric Dentistry Sector.

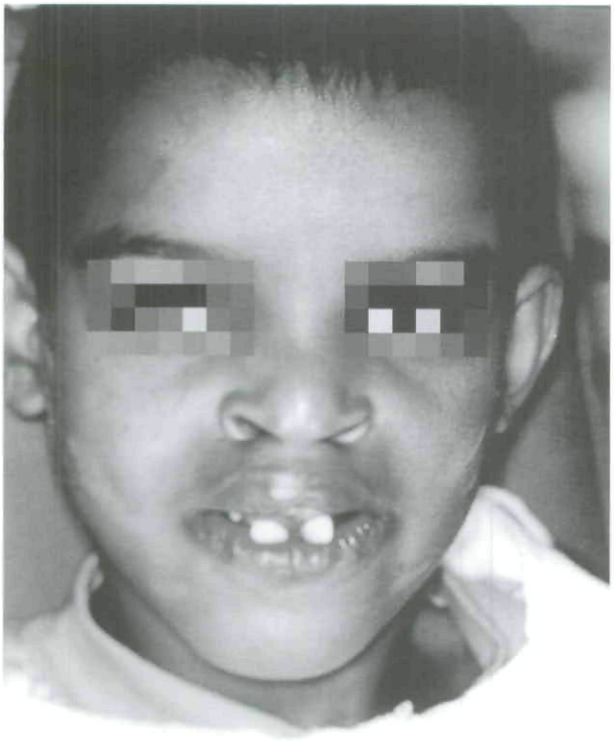

Fig. 1. Frontal facial aspect of the anterior projection of the premaxilla in patient with operated bilateral cleft.

Fig. 2. Profile facial aspect of the anterior projection of the premaxilla in patient with unoperated bilateral cleft.

Table 1. Numerical distribution and percentage of the sample according to age and gender

Age (years)	Male (%)	Female (%)	Total
0–3	17 (57)	13 (43)	30
4–6	12 (60)	8 (40)	20
7–9	41 (73)	15 (27)	56

The premaxilla of patients with bilateral clefts in childhood presents projection even after the accomplishment of lip surgery; thus, this was not an exclusion criteria for the sample, which included both operated and unoperated patients.

For evaluation of the patients, an interview was carried out with the caretakers, aiming at the occurrence of trauma to the soft and/or hard tissues of the child's mouth. When there was a history of trauma, a clinical examination was carried out at the dental chair by means of a dental mirror and probe and, whenever possible, radiographic examination and photographs of the affected area were also obtained, with previous

agreement from the patient's caretakers, who filled a specific form regarding the following aspects.

1 Period of time spent by the child with their parents and at school.
2 Presence or absence of siblings
3 Age of the child at the moment of the trauma.
4 Place where the trauma occurred.
5 Area affected by the trauma.
6 Type of trauma.
7 Alterations in the permanent teeth that succeeded the traumatized deciduous teeth.

The statistical analysis was carried out through the chi-square test, in an attempt to find out possible associations between the occurrence of trauma and the variables included in the study.

Results

From the 106 patients of the sample, 53% (56) reported having suffered oral traumatism, being that 91% (51) presented soft tissue lesions. Regarding the hard tissue traumatisms, avulsion was observed in five cases (8.9%), luxation in four cases (7%) and intrusion in just one case (1.8%).

The distribution of traumatism among the children (Table 2) did not demonstrate any statistically significant difference regarding prevalence and gender ($\chi^2 = 0.69$, $P = 0.407$).

The majority of the cases of trauma observed in this study (80%) took place up to 3 years old and the child's home was the main place for the occurrence of trauma (89%).

No positive association could be detected between the occurrence of oral trauma and the period of time spent by the children with their parents and/or at school ($\chi^2 = 0.76$, $P = 0.683$), or with the presence of siblings ($\chi^2 = 0.65$, $P = 0.551$).

Most of the oral traumatisms, namely 75% (42) affected the soft tissues of the premaxilla, followed by 16% (nine) that involved the maxillary incisors (Figs 3 and 4). In 9% (five) of the cases, there was an association between lesions in the premaxilla and maxillary incisors.

It was also observed that, among the children with history of trauma, 45% (25) presented alterations in the maxillary incisors that succeeded the traumatized deciduous teeth, being 48% of structure and 52% of structure and position.

Table 2. Distribution of traumatism between genders

Gender	Female (%)	Male (%)
Trauma	17 (47)	39 (56)
Without trauma	19 (53)	31 (44)
Total	36 (100)	70 (100)

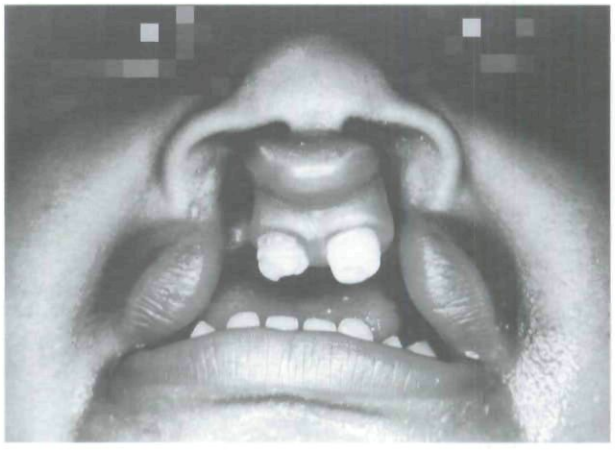

Fig. 3. Enamel fracture of the deciduous maxillary right central incisor secondary to oral traumatism.

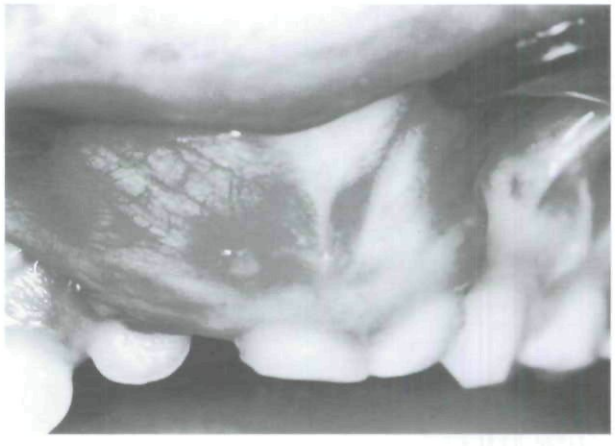

Fig. 4. Crown discoloration and presence of fistula, indicating endodontic involvement of the deciduous maxillary right central incisor secondary to oral traumatism.

Discussion

The analysis of the prevalence of oral trauma observed in this study reveals that it presented higher numbers when compared to other studies in the literature on individuals with clefts (29) or without clefts (1, 3, 5–7, 9, 11–14, 20, 30–32), which ranged from 11 to 45%. The complete bilateral clefts present as an inherent anatomical characteristic the projection of the premaxilla, even after accomplishment of lip surgery, consequently providing the subject with a quite convex profile, especially during the first year of life. This factor might be able to jeopardize these children to higher risks of trauma in this area.

In this study, the premaxilla was the most affected structure, with soft tissue lesions, what confirms the previous statement. The literature regarding trauma in the deciduous dentition reveals that some authors

have been finding a remarkable occurrence of soft tissue lesions (10, 12, 18, 23, 24, 29), although Mestrinho et al. (11) and Al-Majed et al. (32) reported that the dental fractures are the most common injuries (Fig. 3), whereas Borum & Andreasen (33) consider the discoloration of the crown (Fig. 4). Similarly to individuals of the general population, the maxillary incisors were the teeth that were most affected by oral traumatisms (1, 9, 11–13, 15, 17, 19, 22, 23, 25, 30), especially the central incisors (1, 11, 13, 15, 17). Among the hard tissue lesions, the prevalence of avulsion, luxation and intrusion observed in this study was similar to that observed in non-cleft individuals (2, 12, 18, 23, 24).

Another important aspect was the age when the majority of traumas occurred, i.e. during the first 3 years of life, what is similar to the general population (1, 3, 4, 10, 12, 15, 16, 18, 19), although Mestrinho et al. (11) reported a larger prevalence around 5 years of age. It is well known that, during this initial period of children's life, they are developing and exploring their physical skills through activities such as walking and running, despite of a possible lack of proper motor co-ordination, which jeopardizes them to frequent falls and consequently to oral traumatisms.

It was also verified that 45% of the permanent incisors correspondent to the traumatized deciduous teeth presented alterations, being 48% of structure and 52% of structure and position. Joho & Marechaux (15) and Soporowski et al. (16) stated that structural alterations were the most common sequels in the permanent teeth succeeding traumatized deciduous teeth. Nevertheless, this study did not allow the statement that the alterations observed among permanent incisors took place exclusively as a consequence of the trauma on the antecessor deciduous teeth, as the cleft itself predisposes the individual to a higher prevalence of dental anomalies of structure and position in the teeth adjacent to the cleft. In order to exclude such possibility, a study on the occurrence of alterations of structure and position of the incisors in individuals with clefts without history of dental trauma would be required, for comparison with the results obtained in this study.

The current profile of families whose children are looked after at school or by other people, in virtue of the parents' professional activities, might bring about a less efficacious supervision, exposing the children to a higher risk of accidents. In this study, the analysis regarding this aspect in relation to oral trauma did not show any significant statistical association. In the same way, the presence or absence of siblings did not influence the occurrence of traumas.

Corroborating the findings in the literature concerning children without clefts that relate the maxillary overjet to an increased occurrence of oral trauma, this study demonstrated that individuals with bilateral clefts present a remarkable exposure of the premaxilla to traumas, as a consequence of its anterior projection, although more severe lesions than that observed among non-cleft subjects were not observed.

Thus, this feature highlights that the pediatric dentist should pay special attention to a further particularity of the child with a cleft, especially in case of bilateral clefts, as it is known that facial, dental and soft tissue traumas of the mouth are able to bring in physical and emotional complications, both for the child and the parents. Therefore, the professional must be prepared to calm them down, keeping control over the situation in order to gather data on the incident, to carry out the clinical examination and consequently to indicate the proper treatment, reducing the impact the oral trauma might bring about to a face that is already affected by the malformation.

References

1. Bijella MF, Yared FN, Bijella VT, Lopes ES. Occurrence of primary incisor traumatism in Brazilian children: a house-by-house survey. ASDC J Dent Child 1990;57:424–7.
2. Cardoso M, de Carvalho Rocha MJ. Traumatized primary teeth in children assisted at the Federal University of Santa Catarina, Brazil. Dent Traumatol 2002;18:129–33.
3. Carvalho JC, Vinker F, Declerck D. Malocclusion, dental injuries and dental anomalies in primary dentition of Belgian children. Int J Paediatr Dent 1998;8:137–41.
4. Cunha RF, Pugliesi DMC, Vieira AEM. Oral trauma in Brazilian patients aged 0–3 years. Dent Traumatol 2001;17:210–2.
5. Garcia-Godoy F, Sanchez JR, Sanchez RR. Proclination of teeth and its relationship with traumatic injuries in preschool children. J Pedod 1982;6:114–9.
6. Garcia-Godoy F, Morban-Laucer F, Corominas LR, Franjul RA, Noyola M. Traumatic dental injuries in preschool-children from Santo Domingo. Community Dent Oral Epidemiol 1983;11:127–30.
7. Hargreaves JA, Cleaton-Jones PE, Roberts GJ, Williams S, Matejka JM. Trauma to primary teeth of South African pre-school children. Endod Dent Traumatol 1999;15: 73–6.
8. Kahabuka FK, Plasschaert A, van't Hof M. Prevalence of teeth with untreated dental trauma among nursery and primary school pupils in Dar es Salaan, Tanzania. Dent Traumatol 2001;17:109–13.
9. Kargul B, Çaglar E, Tanboga I. Dental trauma em Turkish children, Istanbul. Dent Traumatol 2003;19:72–5.
10. Llarena del Rosario ME, Acosta Alfaro VM, Garcia-Godoy F. Traumatic injuries to primary teeth in Mexico City children. Endod Dent Traumatol 1992;8:213–4.
11. Mestrinho HD, Bezerra ACB, Carvalho JC. Traumatic dental injuries in Brazilian pre-school children. Braz Dent J 1998;9:101–4.
12. Schatz JP, Joho JP. A retrospective study of dento-alveolar injuries. Endod Dent Traumatol 1994;10:11–4.

13. Osuji OO. Traumatized primary teeth in Nigerian children attending University Hospital: the consequences of delays in seeking treatment. Int Dent J 1996;46:165–70.
14. Zadik D. A survey of traumatized primary anterior teeth in Jerusalem preschool children. Community Dent Oral Epidemiol 1976;4:149–50.
15. Joho JP, Marechaux SC. Trauma in the primary dentition: a clinical presentation. ASDC J Dent Child 1980;47:167–74.
16. Soporowski NJ, Allred EN, Needleman HL. Luxation injuries of primary anterior teeth-prognosis and related correlates. Pediatr Dent 1994;16:96–101.
17. Fried I, Erickon P, Schwartz S, Keenan K. Subluxation injuries of maxillary primary anterior teeth: epidemiology and prognosis of 207 traumatized teeth. Pediatr Dent 1996;18:145–51.
18. Harrington MS, Eberhart AB, Knapp JF. Dentofacial trauma in children. ASDC J Dent Child 1988;55:334–8.
19. Lombardi S, Sheller B, Williams BJ. Diagnosis and treatment of dental trauma in a children's hospital. Pediatr Dent 1998;20:112–20.
20. Gassner R, Bosch R, Tuli T, Emshoff R. Prevalence of dental trauma in 6000 patients with facial injuries: implications for prevention. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1999;87:27–33.
21. Onetto JE, Flores MT, Garbarino ML. Dental trauma in children and adolescents in Valparaiso, Chile. Endod Dent Traumatol 1994;10:223–7.
22. Wilson CF. Management of trauma to primary and developing teeth. Dent Clin North Am 1995;39:133–67.
23. Filippi A, Pohl Y, Kirschener H. Replantation of avulsed primary anterior teeth: treatment and limitations. ASDC J Dent Child 1997;64:272–5.
24. Mackie IC, Blinkhorn AS. Dental trauma: 1. General history examination and management of trauma to the primary dentition. Dent Update 1996;23:69–71.
25. Fried I, Erickson P. Anterior tooth trauma in the primary dentition: incidence, classification, treatment methods, and sequelae: a review of literature. ASDC J Dent Child 1995;62:256–61.
26. Andreasen JO, Ravn JJ. Epidemiology of traumatic dental injuries to primary and permanent teeth in a Danish population sample. Int J Oral Surg 1972;1:235–9.
27. Chelotti A, Valetin C, Prokopowitsch I. Lesões traumáticas em dentes decíduos e permanentes jovens. In: Guedes-Pinto AC, editor. Odontopediatria, 6th edn. São Paulo: Editora Santos; 1997. p. 631–55.
28. Andreasen JO. Etiology and pathogenesis of traumatic dental injuries. A clinical study of 1928 cases. Scand J Dent Res 1970;78:329–42.
29. Lontra CM. Prevalência de traumatismo bucal na dentadura decídua de portadores de fissuras de lábio e/ou palato [Monografia]. Bauru: Hospital de Pesquisa e Reabilitação de Lesões Lábio-Palatais, Universidade de São Paulo; 1997.
30. von Arx T. Developmental disturbances of permanent teeth following trauma to the primary dentition. Aust Dent J 1993;38:1–10.
31. Borssien E, Holm AK. Traumatic dental injuries in a cohort of 16-year-old in northern Sweden. Endod Dent Traumatol 1997;13:276–80.
32. Al-Majed I, Murray JJ, Maguire A. Prevalence of dental trauma in 5–6 and 12–14-year-old boys in Riyadh, Saudi Arabia. Dent Traumatol 2001;17:153–8.
33. Borum MK, Andreasen JO. Sequelae of trauma to primary maxillary incisors. I. Complications in the primary dentition. Endod Dent Traumatol 1998;14:31–44.