Dental Traumatology 2005; 21: 131–133

DENTAL TRAUMATOLOGY

Evaluation of intruded primary incisors

Gondim JO, Moreira Neto JJS. Evaluation of intruded primary incisors. Dent Traumatol 2005; 21: 131–133. © Blackwell Munksgaard, 2005.

Abstract – Tooth intrusion consists of the displacement of the tooth into its alveolus and is the most common trauma during early infancy. This work aims to evaluate the aspects related to tooth intrusion in primary teeth by monitoring 16 patients (22 teeth) for a period between 3 and 36 months. Of the patients who suffered from tooth intrusion, 56.25% were male and 91% of the intruding teeth were upper central incisors. In all cases the treatment indicated was to await spontaneous re-eruption: total re-eruption occurred in 42.5% of cases, partial re-eruption in 47% of cases and in 10.5% there was no re-eruption. Twenty-three percentage of the teeth suffered necrosis, 33% suffered internal or external root resorption and none suffered root canal obliteration.
Fifty-seven percentage indicated healthy pulps independent of degree of re-eruption.

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Key words: primary teeth; tooth injuries; tooth intrusion

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Accepted 31 March, 2004

According to Andreasen (1994) (1), one-third of children at the stage of primary dentition suffers traumatic injuries to the mouth. Among these types of injuries, intrusive dislocation is the most frequent. Intrusive dislocation consists of the dislocation of the tooth into the interior of the alveolar bone and may be accompanied by a fragmentation or fracture of the alveolar cavity (1, 2). This type of trauma is most common during the phase of primary dentition when the patient is between 1 and 3 years of age (1, 3, 4), a period when the crowns of the permanent successors are being formed and the alveolar bone is more resilient (5).

The diagnosis is based on anamnesis and the combination of clinical and radiographic findings, including: visual inspection, palpation and percussion. Depending on the vestibular curvature of the root of the primary teeth and the direction of the impact, the apexes of these teeth are usually dislocated into the vestibular. This diagnosis is extremely important to determine whether the germ of the successor has been affected or not and may be checked using X-ray.

The aim of this study is to evaluate the epidemiological aspects related to tooth intrusion during primary dentition through examination and monitoring of patients seen at the Pediatric Clinic of the Federal University of Ceará (UFC).

Materials and methods

Design of the Study

This is a prospective observational epidemiological study. From the diagnosis onwards the patients receive standard treatment and are monitored for pre-established periods.

Sample. patients seen in the Pediatric Dentistry Clinic of UFC who have suffered intrusive injuries of primary teeth up to March 2003.

Criteria for inclusion. Must have an initial photograph or X-ray; must have at least 3 months of monitoring; patient records must be adequately filled in; patients are assumed to be healthy.

The records of the patients being observed were analyzed for the following aspects: age, gender, cause of accident; immediate treatment carried out: extraction or waiting for spontaneous re-eruption; association with other types of trauma; the number and type of teeth involved; the process of re-eruption: total re-eruption without consequences to the primary tooth itself; total re-eruption with some consequences; partial re-eruption; no re-eruption; the condition of the dental pulp. The dental pulp's vitality is evaluated throughout the monitoring process through clinical observations (testing sensitivity to the cold using Endofrost®

(Coltène-Whaledent, Langenau, Germany), alterations in color, the existence of fistula) and radiological observations (as to the existence of internal and/or external root resorption, bone rarefaction and an increase in the space of periodontal ligament); periodontal condition: the condition of periodontal support of the tooth was evaluated through mobility test and X-rays.

The patients or their guardians were informed of the diagnosis and the proposed treatment planning for each case. They received a consent form in which they authorized the proposed treatment as well as the use of patient records and tests for teaching and research purposes. The research was approved by the UFC's Research Ethics Committee, under process no. 137/03.

Results

The records of 28 patients with intrusion were analyzed and according to the inclusion criteria, 16 patients took part in the present study, giving a total of 22 teeth. The patients were between 2 and 4 years of age. The average age of the patients was 3 (62.5%) and the average period of monitoring was of 8 months, varying between 3 and 36 months. There was a minimum of 15 days for teeth to be extracted during the clinical control phase. There were slightly more boys with dental trauma than girls; 56.25% male patients and 43.75% female.

In relation to the causes of intrusive injuries, the following results were observed: a fall from their own height while walking or running (62.5%); while playing with bicycle or tricycle (12.5%); impact against a hard object (12.5%); in some cases the responsible party did not know how the accident had happened (12.5%).

From the 16 patients observed in this study, 28 teeth suffered traumatic injuries and 22 of them suffered intrusion. These were all upper anterior primary teeth, of which 91% were central incisors and only 9% were lateral incisors. In a little over half of these patients (56.25%) the intrusion was associated to other types of trauma such as: the laceration of soft tissues and/or other types of injury and dental detachments.

For all the patients in this study, the treatment indicated after clinical examinations and X-rays were to monitor the case and await spontaneous re-eruption. Only one case resulted in extraction of the tooth during the first control session because in addition to the intrusion there was a significant lateral dislocation with great mobility and the party responsible for the child, after professional advice, opted for extraction as the treatment plan.

As to the process of spontaneous re-eruption it can be observed that in 28.5% of the teeth there was total spontaneous re-eruption without any type of consequence. In 14% of cases, there was total re-eruption, however, this was accompanied by consequences such us discoloration, necrosis of the pulp and/or root resorption. There was partial re-eruption in 47% of cases and no eruption in 10.5% of cases.

Of the total, 23% of the teeth suffered necrosis, 33% suffered internal and/or external root resorption, none suffered obliteration of the pulp canal and 57% were healthy independently of the degree of re-eruption. In relation to the condition of periodontal support: 19% presented bone loss, while 19% presented mobility level I.

Discussion

Dental trauma is frequent in infancy, Andreasen & Andreasen (1994) state that these injuries occur mainly during early infancy (between 2 and 3 years of age). This study has a similar age range (2–4 years) with a greater number of boys suffering injury than girls (1, 3, 6, 7).

The main causes of these accidents were: falls from their own height with 62.5% of cases occurring while the child was running or walking at home without supervision; 12.5% hit their teeth on a hard object; 12.5% had accidents while playing on tricycles or bicycles and in the remaining cases (12.5%) the responsible party did not have this information. From our results and the data obtained in the literature it can be observed that in most cases both the age range and the reason for the trauma are related to the period when children are learning to walk (1, 2, 4, 6, 8, 9). Under these conditions, preventive care is difficult as the child has few defensive reflexes during this developmental stage.

This study evaluates the intrusive injury, considered by the literature the most common trauma in primary dentition (10). Usually the front teeth, especially the upper central incisors, are involved because of their anatomical location, which leaves them more exposed and thus vulnerable to injury.

Of the intruded teeth evaluated in this study 91% were central upper incisors and 9% were lateral upper incisors, which is comparable with the results observed in the literature (11, 12).

In addition to the cause of the accident another important aspect to be evaluated is the direction of impact on the intruding teeth, as this information may assist the professional in their diagnosis of possible injury to the germs of the permanent teeth. For example, the presence of an object in the child's mouth during the trauma may take the crown of the teeth to a more apical and vestibular position

resulting in a dislocation of the root to the lingual, which is the location where the permanent successor develops.

As these teeth generally re-erupt spontaneously and rarely stay impacted, conservative treatment, such as, waiting for spontaneous re-eruption of the impacted primary tooth was the treatment of choice. However, if injury to the developing germ of the permanent successor is suspected then extraction is the preferred treatment (13–15).

This study observed the occurrence the consequences such as dental mobility because of bone loss and root resorption in periods of 10–30 days. Additionally the presence of root resorption was noted only after 4 months of monitoring which indicates: firstly, the need for check-ups with short intervals and over longer periods; and secondly, the importance of motivating the responsible parties to return on the scheduled dates to enable early intervention and to avoid greater consequences to the permanent dentition.

In this study most children sought professional care on either the day of the trauma or the following day. However, in some cases this only occurred after 2 or 3 weeks by which time it was possible to observe consequences requiring treatment. This fact shows the importance of informing the population about the procedures to follow with children who have suffered dental injuries.

During the monitoring period several consequences were observed, such as necrosis of the pulp, root resorption, loss of marginal bone support, mobility and partial re-eruption of the primary tooth. The teeth that suffered necrosis of the pulp and/or root resorption were subjected to a pulpectomy as a conservative attempt to prevent the spread of the infection to the successors and maintain these in a viable manner within the oral cavity (1, 2, 9).

Thus it can be observed in this study that the number of consequences observed during the control was high, consequently monitoring of the patients over a minimum period of time is fundamental to minimize the problems resulting from trauma.

Conclusions

According to our results it can be concluded that:

- A larger number of boys suffered injury than girls.
- The most common cause of these injuries was falling from their own height whilst walking or running at home and playing with bicycles and tricycles.
- The upper central incisors were the most prone to intrusive injury.
- More than half of the teeth did not present consequences during the study's period.
- The most common consequences of intrusions were root resorption followed by necrosis, bone loss and/or dental mobility.

References

1. Andreasen JO, Andreasen FM. Textbook and Color Atlas of Traumatic Injuries to the Teeth, 3rd edn. Copenhagen: Munksgaard, 1994.
2. Walter LRF, Ferelle A, Issao M. Odontologia Para o Bebê. São Paulo: Ed. Artes Médicas, 1996.
3. Andreasen JO, Sundstrom B, Ravn JJ. The effect of traumatic injuries to primary teeth on their permanent teeth. Scand J Dent Res 1971;79:219–83.
4. Montalvo-Polk A, Kittle PE. Impaction and malformation of a maxillary central incisor: sequelae of trauma. J Dent Child 1993;60:29–32.
5. Bassat BY. Effect of trauma to the primary incisor on root development of their permanent successors. Pediatr Dent 1986;8:289–93.
6. Andreasen JO. Etiology and pathogenesis of traumatic dental injuries. Scand J Dent Res 1970;78:329–42.
7. Ellis RG, Davey KW. The Classification and Treatment of Injuries to the Teeth of Children, 5th edn. Chicago: Year Book Publishers Inc, 1970.
8. Chaves CD. Alterações da odontogênese decorrentes de traumatismos em dentes decíduos anteriores: relato de oito casos clínicos. Monografia (Especialização em Odontopediatria). Rio de Janeiro: Faculdade de Odontologia, Universidade Estadual do Rio de Janeiro, 1997.
9. McDonald RE, Avery DR. Dentistry for the Child and Adolescent, 5th edn. St Louis: C. V. Mosby, 1987.
10. 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.
11. Eichenbaum IW. A correlation of traumatized anterior teeth to occlusion. ASDC J Dent Child 1963;30:229–36.
12. Parkin SF. A recent analysis of traumatic injuries to children's teeth. ASDC J Dent Child 1967;334:323–5.
13. Belotosky L, Schwartz Z, Soskolne WA. Undiagnosed intrusion of a maxillary primary incisor tooth: 15-year follow up. Pediatric Dent 1986;8:294–6.
14. Schreiber CK. The effect of trauma on the anterior deciduous teeth. Br Dent J 1959;106:340–3.
15. Holan G, Ram D. Sequelae and prognosis of intruded primary incisors. Pediatric Dent 1999;21:242–7.