Case Report

Odontoma-like malformation in a permanent maxillary central incisor subsequent to trauma to the incisor predecessor

Nelson-Filho P, Silva RAB, Faria G, de Freitas AC. Odontomalike malformation in a permanent maxillary central incisor subsequent to trauma to the incisor predecessor. Dent Traumatol 2005; 21: 309–312. © Blackwell Munksgaard, 2005.

Abstract – This report describes a case of a patient (1 year and 8 months old) with traumatic avulsion of the maxillary right primary central incisor and morphological changes in the germ of the permanent successor. One year after the trauma, an odontoma-like malformation developed. This malformation was removed 6 years after trauma and orthodontic treatment was started. Clinical follow-up and periodic radiographs are necessary after traumatic avulsion of primary teeth to monitor possible sequelae in the permanent successor. An odontoma-like malformation requires a multidisciplinary approach.

Paulo Nelson-Filho, Raquel A. B. Silva, Gisele Faria, Aldevina Campos de Freitas

Department of Pediatric Dentistry, Faculty of Dentistry of Ribeirão Preto, University of São Paulo, Ribeirão Preto, SP, Brazil

Key words: odontoma-like malformation; traumatism

Dr Paulo Nelson-Filho, Departamento de Clínica Infantil, Odontologia Preventiva e Social, Faculdade de Odontologia de Ribeirão Preto – USP, Avenida do Café, S/N, 14040-904, Ribeirão Preto, SP, Brazil Tel.: +55 16 602 4099 Fax: +55 16 633 0999 e-mail: nelson@forp.usp.br Accepted 9 November, 2004

Different types of traumatic injuries affect the primary dentition. However, primary incisors are highly liable to luxation injuries, which constitute 21–81% of traumatic injuries of these teeth (1, 2). Because of the close relationship between the apices of primary teeth and the germs of the permanent successors, developmental disturbances in the permanent dentition are common after trauma to primary teeth, varying from 12 to 69% (2, 3). Traumatic avulsion and intrusive luxation are the most frequent types of trauma that affect the development of permanent successors (2, 3).

Several developmental alterations in the permanent teeth have been reported as a consequence of injuries to their predecessor teeth. These developmental injuries may be simple or complex, extensive or local (4), affecting the crown, root or entire dental germ (2). Enamel hypoplasia is the most frequent developmental anomaly of permanent dentition, however, enamel hypomineralization, coronary or root dilacerations and root duplication may also occur. Rare anomalies include total or partial arrest of root formation, sequestration of the permanent tooth germ and odontoma-like malformation (2).

The purpose of this paper is to report a case of odontoma-like malformation in a permanent maxillary central incisor subsequent to traumatic avulsion of the primary incisor predecessor.

Case report

A female patient (1 year and 8 months old) was examined at the Pediatric Clinic of the Faculty of Dentistry of Ribeirão Preto (Brazil) shortly after trauma causing the severe intrusive luxation of the maxillary right primary lateral incisor with dislocation of the root in the palatal direction and traumatic avulsion of the maxillary right primary central incisor. After evaluation of her medical history and obtaining written informed consent for treatment from the person responsible for the child, a radiograph was taken which showed positional changes of the germ of the maxillary right central



Fig. 1. Occlusal radiograph after extraction of the maxillary right primary lateral incisor, showing positional changes in the germ of the maxillary right central incisor.



Fig. 2. Radiograph at 1 year follow-up showing the odontomalike malformation of the maxillary right central incisor.

incisor. The maxillary right primary lateral incisor was then immediately extracted (Fig. 1).

The patient returned for periodic clinical and radiographic follow-up at 2 and 6 months and 1 year (Fig. 2), at which time an odontoma-like malformation was observed radiographically. After 2 years and 9 months, the patient no longer



Fig. 3. Clinical aspect 6 years after trauma showing the lack of eruption of the maxillary right central incisor and the ectopic eruption of the maxillary right permanent lateral incisor.

returned to the clinic and was evaluated again only 6 years after trauma. At this time, the maxillary right permanent lateral incisor had erupted at the position of the maxillary right permanent central incisor (Fig. 3) and the formation of a structure similar to a root in odontoma-like malformation was seen radiographically (Fig. 4). Surgery was performed to remove this malformation (Fig. 5) and orthodontic treatment was begun (Fig. 6).

Discussion

Dental injuries in young children may seriously disturb further growth and maturation of developing permanent teeth because of their close anatomical relationship to the apices of the primary teeth (5). The extent of the disturbance of the developing germ is related to the severity and direction of the impact on the primary teeth and stage of germ development (the child's age at time of injury) (6).

The permanent germ is located somewhat palatal to the root of the primary tooth. When a force is applied to the labial surface of a primary maxillary central incisor crown, the root will move labially away from the permanent tooth, with less chance for a disturbance to the permanent tooth. When a force is applied to the palatal surface of a primary maxillary incisor crown, the root of the primary incisor is moved in a palatal direction thereby causing trauma to the developing permanent tooth (7). This usually occurs in cases of traumatic avulsion, which



Fig. 4. Radiograph at 6 years follow-up showing the structure similar to a root in odontoma-like malformation.

Odontoma-like malformation subsequent to traumatism



Fig. 5. Surgical removal of the odontoma-like malformation.



Fig. 6. Orthodontic treatment for correction of the medial line.

according to Andreasen and Andreasen (2), is one of the types of trauma to primary teeth with the greatest possibility of causing sequelae in permanent teeth successors.

In the present clinical case, the traumatic force probably dislocated the root of the maxillary right primary central incisor to the palatal direction during avulsion, causing alteration in the position of the germ of the maxillary right central incisor, detected radiographically after trauma.

The relationship between the age of the child at the time of trauma and the resulting disturbances in permanent dentition has been reported in many studies (7–10). Hard tissue formation of permanent maxillary central incisors begins at 3–4 months with completion of enamel at 4–5 years of age (11). Any trauma during the stage of odontogenesis can seriously affect the morphogenetic stages of dental development (2).

According to Ravn (7) the frequency of disturbed normal development of the permanent teeth is 94.5% in traumas occurring before 2 years of age and the more serious disturbances are most common when the injury occurs at <3 years of age. In the present case, the trauma occurred at 1 year and 8 months, affecting the germ of the permanent successor, which was in the initial stages of odontogenesis, leading to the development of an odontoma-like malformation.

Odontoma-like malformation is an anomaly that affects permanent teeth after trauma to the primary dentition. It is a mass of mineralized tissue slightly similar to the dental germ and may have a relatively normal or rudimentary root (2), as in the present case. Malformations similar to an odontoma should generally be removed surgically at a suitable time (2). In the present case, the malformation was detected 1 year after trauma; however, its removal was delayed because of the early stage of formation of the adjacent permanent teeth germs in order to avoid damage during surgery.

Four months after removal of the malformation, orthodontic treatment was recommended for the correction of the medial line and later esthetic reconstruction of the maxillary right permanent lateral incisor and canine, to obtain harmony of her smile.

In conclusion, after traumatic avulsion of primary teeth, the child should have periodic clinical and radiographic follow-up examinations to monitor possible sequelae of the permanent successor teeth. In this manner, early diagnosis can be made and adequate multidisciplinary treatment begun, involving pediatric dentistry, surgery, orthodontics and restorative dentistry.

References

- Garcia-Godoy F, Garcia-Godoy F, Garcia-Godoy FM. Primary teeth traumatic injuries at a private pediatric dental center. Endod Dent Traumatol 1987;3:126–9.
- Andreasen JO. Injuries to developing teeth. In: Andreasen JO, Andreasen FM, editors. Textbook and Colour Atlas of Traumatic Injuries to the Teeth, 3rd edn. Copenhagen: Munksgaard, 1994:457–94.
- Abbott PV, Gregory PJ. Complicated crown fracture of an unerupted permanent tooth – a case report. Endod Dent Traumatol 1998;14:48–56.
- Torneck CD. Effects and clinical significance of trauma to the developing permanent dentition. Dent Clin North Am 1986;41:96–99.
- Diab M, Elbadrawy HE. Intrusion injuries of primary incisors. Part I: Review and management. Quintessence Int 2000;31:327–34.
- Diab M, Elbadrawy HE. Intrusion injuries of primary incisors. Part III: Effects of the permanent successors. Quintessence Int 2000;31:377–84.
- Ravn JJ. Developmental disturbances in permanent teeth after exarticulation of their primary predecessors. Scand J Dent Res 1975;83:131–4.
- Borum MK, Andreasen JO. Sequelae of trauma to primary maxillary incisors. I. Complications in primary dentition. Endod Dent Traumatol 1998;14:31–44.

Nelson-Filho et al.

- Brin I, Ben-Bassat Y, Zilberman Y, et al. Effect of trauma to the primary incisors on the alignment of their permanent successors in Israelis. Community Dent Oral Epidemiol 1998;16:104–8.
- 10. Taniguchi K, Okamura K, Hayashi M, et al. The effect of mechanical trauma on the tooth germ of rat molars at

various developmental stages: a histopathological study. Endod Dent Traumatol 1999;15:17–25.

 McDonald RE, Avery DR, Lynch TR. Management of trauma to the teeth and supporting tissues. In: McDonald RE, Avery DR, editors. Dentistry for the child and adolescent. St Louis: Mosby, 1987:532–8. This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.