

## Apical fenestration and ectopic eruption – effects from trauma to primary tooth: a clinical case report

### CASE REPORT

**Thaís Cezária Triches, Leonardo Koerich Paula, Marcos Ximenes Filho, Michele Bolan**

Department of Dentistry, Federal University of Santa Catarina, Florianópolis, Brazil

**Abstract** – The study describes a multidisciplinary treatment of fenestration in the apical of a primary maxillary right central incisor due a trauma and also its sequel, an ectopic eruption of the permanent maxillary right central incisor, on 7-year-old boy. Clinically, the primary tooth had an enamel and dentin fracture with no pulp exposure. There was an apical fenestration in the vestibular region, and the permanent tooth had an ectopic palatal eruption. The primary tooth was extracted, and for the physiological reposition of the permanent tooth, which was crossed with its antagonist, a Haas appliance was used for the rapid expansion of the maxilla for a period of 9 days.

Correspondence to: Thaís Cezária Triches, Street Paulo Furtado Lucena, 101, Centro, Terra Roxa, PR 85990-000, Brazil  
Tel.: +55 4499762889  
Fax: +55 4837219920  
e-mail: ttriches@ibest.com.br

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Cariou lesions and trauma are etiological factors that result in severe inflammation/infection processes. The dissemination of pulp infection from a primary tooth to the periradicular region can lead to pathological root resorption of the primary tooth or apical fenestration. Morphological and chronological development alterations as well as ectopic eruption may occur in the successor (1).

Apical or mucosal fenestration is a rare, asymptomatic, pathological condition characterized by progressive resorption of the alveolar bone around one or more teeth, with exposure of the root apex to the oral environment without the occurrence of root resorption (2, 3). This exposure makes the root susceptible to the presence of biofilm and the formation of calculus. Such factors impede the spontaneous healing of the lesion (4). In cases diagnosed as fenestration, the treatment of choice is extraction of the infected primary tooth, thereby protecting the permanent successor from possible damage (2, 5).

Ectopic eruption is an alteration in the eruption trajectory, forcing the tooth to erupt out of position. For treatment, orthodontic assessment is needed for the subsequent correction of the malocclusion (6, 7).

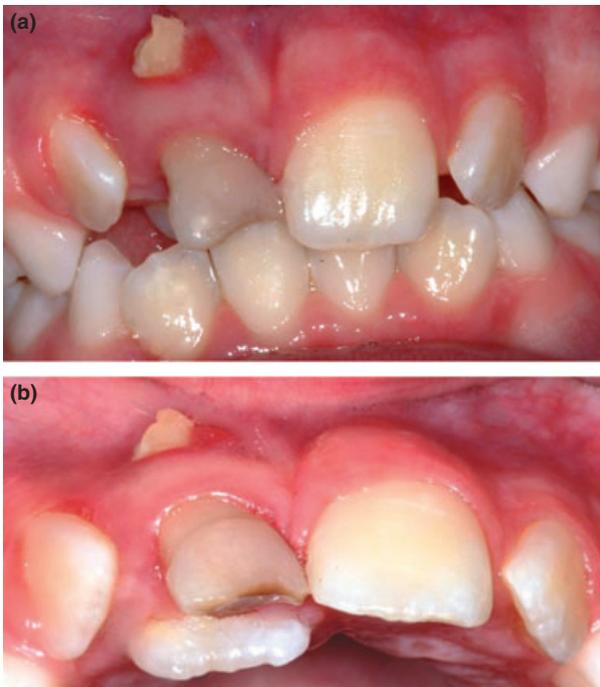
This article reports the multidisciplinary treatment (surgical and orthodontic procedures) of a case of apical fenestration in a primary tooth caused by a process of infection stemming from trauma, with the ectopic eruption of the permanent successor.

### Case report

A 7-year-old boy visited the pediatric dentistry clinic of the Federal University of Santa Catarina (Florianópolis, SC, Brazil) complaining of prolonged retention of the primary maxillary right central incisor. The mother reported that the child had suffered trauma to this tooth at two years of age and the tooth became dark when the child was five years of age. The clinical exam revealed enamel and dentin fracture, carious lesion and exposure of the root apex in the vestibular region of the tooth. The margin of the surrounding mucosa was inflamed. The permanent maxillary right central incisor exhibited palatal ectopic eruption, with a notable lack of mesiodistal space for correct positioning (Fig. 1 A-B). The radiographic exam revealed that the rhizolysis of the primary maxillary right central incisor was not proportional to the development stage of the permanent maxillary right central incisor.

With the diagnosis of apical fenestration confirmed, the proposed treatment was extraction of the primary maxillary right central incisor, which allowed the continuity of the eruption of the permanent successor.

Two weeks after the extraction, the patient returned for follow up and there was complete healing of the affected region (Fig. 2). For the repositioning of the permanent maxillary right central incisor, which was crossed with its antagonist, a Haas appliance was used



*Fig. 1.* (a) Enamel and dentin fracture of primary maxillary right central incisor with the presence of apical fenestration in the vestibular region of the tooth. (b) Permanent maxillary right central incisor exhibiting palatal ectopic eruption.

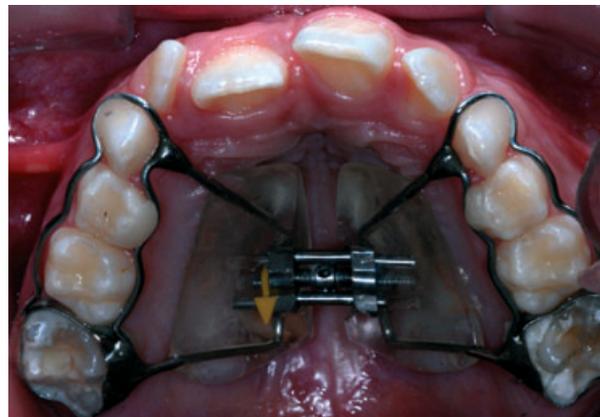


*Fig. 2.* Two weeks after the extraction, there was complete healing of the affected region.

for the rapid expansion of the maxilla for a period of nine days (Fig. 3). For contention, the Haas appliance was maintained for a period of six months. During this time, the force exercised by the tongue enabled the physiological repositioning of the permanent maxillary right central incisor, thereby uncrossing the bite (Fig. 4).

**Discussion**

There are few case reports addressing fenestration in primary teeth (2, 5). The prevalence of this condition



*Fig. 3.* Rapid expansion of the maxilla using a Haas appliance for a period of 9 days.



*Fig. 4.* Clinical aspect after the use of Haas appliance for a period of 6 months and physiological repositioning of permanent tooth.

ranges from 7.5 to 20%. It is more frequent in the anterior region of the maxilla and mandible, nearly exclusively on the vestibular surface of the alveolar bone and the main etiological factors are chronic infection because of caries and dental trauma (3, 5). The first step in the treatment of apical fenestration is to identify the main etiological factor. In the present case, the etiology was periapical infection stemming from trauma to the primary maxillary right central incisor.

Development disorders in permanent teeth may result from the proximity of the germ to the root apex of the primary tooth. Ectopic eruption is a type of disorder caused by the physical displacement of the germ of the permanent tooth. Reports have demonstrated children at younger ages at the time of trauma have a greater likelihood of experiencing effects in the permanent successor (6). In the case reported here, trauma to the primary maxillary right central incisor when the child was 2 years of age led to the ectopic eruption of the successor.

Researchers are unanimous in affirming that extraction is the treatment of choice for primary teeth affected by fenestration (2, 5). In the present report, extraction was effective at removing the focal point of infection, and the follow-up examination revealed satisfactory healing of the affected area. However, Aguiló & Bagán (2) report two cases in which children suffered intrusion of teeth that subsequently exhibited apical fenestration.

In these cases, extraction of the affected tooth was insufficient to heal the gingival lesion, as the patients still exhibited pyogenic granuloma in the affected areas.

The successful use of a Haas orthopedic appliance has been proven in the literature. This device had the advantage of rapid expansion of the maxilla and is a more conservative procedure (8). In this case, success was achieved with an increase in the arch perimeter, and the gain in space allowed the physiological repositioning of tooth permanent maxillary right central incisor, which had been crossed with its antagonist. This is, therefore, a viable alternative for the multidisciplinary approach to cases of space loss in pediatric dentistry patients.

### Conclusion

Extraction of the deciduous tooth was effective in the treatment of apical fenestration. The Haas appliance provided the necessary space for the physiological repositioning of the permanent tooth.

This study highlights the relevance of the relationship between primary and permanent teeth and illustrates the importance of the primary dentition in the development of the stomatognathic system. This multidisciplinary management strategy is especially important in cases in which dental trauma causes sequels to the permanent tooth.

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