# Crown-root fracture of a lower first primary molar: report of an unusual case

# CASE REPORT

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Dento-alveolar injuries are very common lesions in childhood (1, 2), many times representing unique problems for diagnosis and treatment. Their prevalence in early ages varies from 4.6% to 30.2% (1), and more specifically, it is about 15% in the primary dentition (3). The peak of incidence of dento-alveolar traumas in this dentition occurs between the ages of 2 and 4 (1), involving more boys than girls and affecting more frequently the upper central incisors (1, 2, 4–7).

The classification of traumatic dental injuries proposed by Andreassen & Andreassen (2001) (1) can be described as follows: injuries to the hard dental tissues and the pulp; injuries to the hard dental tissues, the pulp and the alveolar process; and injuries to the periodontal tissues. Regarding the primary teeth, particularly, the most frequently reported traumas are those affecting the dental support structures, that is, luxations due to the increased bone resilience (1, 2, 4).

Some possible causes of dental injuries are iatrogeny, falls, collisions, aggressions, bike and car accidents, and sports practices (1, 2, 4). Oral lesions occurring in these events can result from either direct mechanisms, when the tooth itself is hit, most of the times causing damages to the anterior part of the dental arches, or indirect mechanisms, when the lower arch is vigorously occluded against the upper one, thus favouring the occurrence of crown or crown-root fractures in posterior teeth (8). In this sense, indirect injuries, such as impacts on the chin region, result in oblique occlusal forces that can lead to fractures involving the crown and even the dental root (1).

Concerning the crown-root fractures, they are defined as fractures involving enamel, dentin and cement, and according to the pulp involvement, they can be further classified as complicated and non-complicated (1). This type of dental injury comprises only 2% of the traumas affecting the primary dentition (9). A rare type of injury is the vertical crown-root fracture extending mesially or distally along the axis of the tooth (10), which usually leads to extraction of the affected primary tooth (1).

In this context, the aim of the present report was to report the diagnosis of an unusual case of complicated crown-root fracture involving a lower first primary molar of a 3-year-old boy as well as to describe the treatment and aspects concerning the follow-up of the patient.

### **Case report**

A 3-year-old Caucasian boy was brought by his mother to the Pediatric Dentistry Clinic of a Public Teaching Institution because he was complaining of pain in a 'broken tooth' (chief complaint). During medical and dental history taking, the mother reported the patient had no health problems, except that he had fallen down at home about two months before. She had not seen the accident. According to her, as the boy had complained of pain only at the moment of the trauma, presenting no discomfort when eating, speaking or brushing his teeth, she did not look for any medical or dental professional opinion. After 2 months, however, the patient complained again of pain and the mother observed a posterior broken tooth during a routine night brushing.

The patient's perioral tissues had no injuries on the extra-oral examination, despite the mother's reports that at the time of the fall there were lacerations on the chin region. There were no problems concerning the temporomandibular joints. On the intraoral examination, a complete primary dentition, good dental hygiene status, and no carious lesions were observed. (Fig. 1a and 1b). The tooth that motivated the consultation (left lower first deciduous molar) presented an aspect of crown fracture and a fistula in the surrounding gingiva (Fig. 2). Periapical radiographic examination revealed the occurrence of a complicated crown-root fracture in tooth 74 as well as the presence of periapical lesion (Fig. 3).

Based on the data obtained on the examinations, extraction of the fractured tooth and immediate space maintenance were the interventions of choice. Before the tooth removal, a band was fitted to tooth 75 and a silicone impression was taken from the left lower quadrant for obtaining a plaster cast to be used as a model. In this model, tooth 74 was removed and a space maintainer was mounted on teeth 73 and 75 in order to keep the space of the tooth to be extracted. In another appointment, the extraction of tooth 74 was performed under local anesthesia and four fragments were extracted (Fig. 4). In the same session, the space maintainer was



*Fig. 1.* (a) Occlusal view of the upper arch. (b) Occlusal view of the lower arch.



*Fig. 2.* Clinical appearance: presence of sinus tract and crown-root fracture of tooth 74.



*Fig. 3.* Periapical radiograph showing a vertical line of fracture through the long axis of the tooth affecting the crown and the mesial root of tooth 74.



Fig. 4. Tooth74 after extraction.

placed. The patient has been seen every 6 months and, after 24 months of follow-up, the space corresponding to the extracted tooth has been maintained since then (Fig. 5). So far, the permanent succeeding tooth, which is



*Fig. 5.* Clinicalview of the space maintainer after 24 months of follow up.

at a developmental stage compatible with its contralateral tooth, has presented no radiographic alterations.

#### Discussion

The frequency of traumatic dental injuries in children and teenagers varies considerably because of the influence of factors such as gender, age, and dentition (1). Bijella et al. (11) found a prevalence of 30.2% in the Brazilian population after examining 576 children between 1 to 6 years old, which is in accordance with studies on other populations (1).

Concerning the gender distribution of these occurrences, the present report agrees with the findings in the literature, where boys are more prone to have dental trauma than girls (1, 2, 4, 5, 12). Concerning the age distribution, there is an agreement with the studies on age prevalence, as the boy in the present study was 3 years old at the moment of the trauma, which also corresponds to one of the age peaks involving these lesions (1). The place where the accident occurred and the fact that it was an unspecific fall also coincide with the most frequently described situation involving dental traumas, that is, at home while playing (1, 2, 5, 8, 12).

On the other hand, the type of trauma described in this case report (complicated crown-root fracture in a posterior deciduous tooth) is not usually found in the deciduous dentition (1, 2, 13, 14). Needleman & Wofman (14) reported a case of a 5-year-old boy who presented a crown-root fracture of both lower second deciduous molars resulting from a trauma. The teeth were extracted and replaced by a distal-shoe space maintainer. Morizaki et al. (13) described a case of crown-root fracture of a left lower first primary molar in a boy aged 21 months only. The tooth was extracted and after the eruption of the second primary molar a space maintainer was placed.

Crown-root fractures in primary dentition are uncommon and this is explained by the fact that the impact on the resilient bones supporting this dentition usually results in a dental displacement instead of damage to the hard tissues (8). The opposite is true for permanent dentition traumas, as they seldom occur in children with primary dentition (1). When traumas affecting primary and permanent teeth are compared, those involving primary dentition are generally limited to the supporting structures. In general, luxations and avulsions are the most common traumas. The higher proportion of injuries affecting the permanent dentition consists of crown and crown-root fractures (1). Nevertheless, the present case suggests that the indirect impact on the tooth was an important factor for causing a crown-root fracture, which is also reported by Needleman & Wofman (14) and Morizaki et al. (13). This occurs because the indirect impact on the chin, for example, usually generates oblique occlusal forces, thus resulting in fractures along the developmental grooves (1).

In two cases found in the literature (13–15), detection of the fractures and appearance of symptoms were not immediate, which corroborate the findings of this report. Regarding the treatment of crown-root fractures in primary teeth, the extraction of the affected teeth is generally chosen (1, 16), as was done in the case described as well as elsewhere (13, 14). A space maintainer appliance aimed at avoiding space loss following the extraction of tooth 74 was immediately placed, as the eruption of the succeeding tooth would still take a long time to occur. It is also important to mention that if the tooth was treated earlier and the fracture had not reached the root surface, pulpectomy with placement of a stainless steel crown might have saved the tooth and avoided the need for a space maintainer.

Following-up these cases is extremely important for determining the possible effects on the succeeding permanent tooth (1), as well as monitoring the space maintainer appliance (17). Therefore, 6-month interval was established for clinical and radiographic examinations until the eruption of the left lower first premolar.

It is also important to mention that the delay in diagnosis and treatment as described in this case report often occurs (1). As a result, it is necessary to advise the parents on the importance of an adequate clinical and radiographic reexamination of the affected tooth, thus avoiding more serious sequels. In addition, the professional is expected to care about the cases of unusual dental injuries as the one described above by making a detailed anamnesis and adequate clinical and radiographic examinations, not restricting the investigation to the upper anterior region.

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