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Lateral dislocation with occurrence of buccal bone plate fracture in a deciduous tooth: clinical case study

Luxação lateral com ocorrência de fratura de tábua óssea vestibular em dente decíduo: relato de caso clínico

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ABSTRACT

Dental trauma can happen at any stage of life; however, it is very common in preschool and school aged children. Dislocation injuries in the primary dentition are the most commonly described traumatic dental injuries in the literature. Tooth displacement in the primary dentition is favored due to the greater porosity and resilience of the alveolar bone. Through the study of a clinical case, this article presents the clinical conduct performed in the case of trauma of lateral dislocation with involvement of a fracture of the buccal bone plate in order to assist the clinical practice of dentists who care for children. The treatment carried out in this clinical case study took into account the magnitude of the displacement, the degree of development of the tooth and its relationship with the permanent germ, the length of time since the trauma, and the degree of cooperation of the child in the face of the suggested treatment. This treatment does not only involve emergency intervention;

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the patient must undergo a radiographic clinical follow-up and control after 30, 60 and 120 days, as well as annually, until the Exfoliation of the deciduous tooth. The child's health was restored aesthetically and functionally.

Indexing terms: Child. Dental care. Tooth injuries.

RESUMO

Traumatismos dentários podem acontecer em qualquer fase da vida, entretanto, é muito comum em crianças na idade pré-escolar e escolar. As lesões de luxação na dentição decídua são as lesões dentárias traumáticas mais comumente descritas na literatura. O deslocamento dentário na dentição decídua é favorecido devido à maior porosidade e resiliência do osso alveolar. Através do relato de caso clínico, o artigo apresenta a conduta clínica realizada diante um trauma de luxação lateral com acometimento de fratura de tábua óssea vestibular no intuito de auxiliar a prática clínica de cirurgiões-dentistas que atendem crianças. O tratamento realizado neste caso clínico levou em consideração a magnitude do deslocamento, o grau de desenvolvimento do elemento dentário e sua relação com o germe do permanente, o tempo de procura após o trauma e o grau de cooperação da criança diante o tratamento sugerido. O tratamento não envolve apenas a intervenção de urgência, o paciente deve passar por um acompanhamento e controle clínico radiográfico depois de 30, 60 e 120 dias e anualmente até a Esfoliação do dente decíduo. Pôde-se verificar que foi restabelecida a saúde da criança no aspecto estético e funcional.

Termos de indexação: Criança. Assistência odontológica. Traumatismos dentários.

INTRODUCTION

Dental trauma can happen at any stage of life; however, it is very common in preschool and school aged children. Dislocation injuries in the deciduous dentition are the most commonly described traumatic dental injuries in the literature because they are more frequent at the ages of 1 to 3 years, a period when children are starting to walk and run and do not present complete development of motor coordination, balance, or the protective reflex. The anterior teeth are the most affected, and the main predisposing factors are anterior open bite and inadequate lip seal [1-4].

Considering the lateral dislocation object of the reported clinical case, we define that this dislocation is characterized as intense trauma that causes displacement of the tooth different from the axial direction, breaking the periodontal ligament and, in most cases, causing fracture or the crushing of the supporting alveolar bone tissue [5-7].

Due to the anatomical position of the deciduous teeth in relation to the permanent ones, there is a high probability that the trauma will cause disturbances in the development of the germs of the succeeding teeth. Tooth displacement in the primary dentition is favored due to the greater porosity and resilience of the alveolar bone in this age group, while tooth fractures are more frequent in the permanent dentition. Thus, the younger the child, the greater the severity of the sequel [3,8,9]. The impact may cause color change or roughness in the tooth enamel, coronal laceration, and disfigurement of the anatomy of the permanent successor teeth, in addition to pulp necrosis, fistulas, cysts and resorption [3-5,10, 11].

Through the study of a clinical case, this article presents the clinical actions taken in the case of trauma of lateral dislocation with involvement of a fracture of the buccal bone plate in order to assist the clinical practice of dentists who care for children.

CASE REPORT

This case involves a healthy 5 year and 2-month-old child. The child had a frontal collision with a classmate at school, resulting in direct force on the upper anterior region of the mouth. There was no fall or fainting after the shock. The profuse bleeding was contained at school, and the child was seen by the pediatric dentist about 30 minutes after the trauma.

The child was conscious but frightened. After the cleaning of the oral cavity with gauze that was moistened with serum, minimal mobility was clinically observed in teeth 51, 52 and 61. However, a block mobility of the dental bone support was observed in the region of teeth 51 and 52, providing evidence of a fracture of the buccal alveolar bone plate and a lateral dislocation of teeth 51 and 52 with displacement of these teeth towards the palatine, in addition to a slight intrusion in the alveolus. There was also laceration of the gingival tissues and lower lip (figure 1). Thus, this injury was classified as a fracture of the alveolar bone plate and lateral dislocation to the palate.

Figure 1. Child, female, 5 years and 2 months old. She slammed her mouth into the forehead of a friend while running in the schoolyard.

At first, anesthesia was applied to the alveolar region, and bidigital hemostasis for tooth repositioning and suture of the gingival tissues were performed. Occlusal relief and semi-rigid dental immobilization were performed buccally for one week with a 0.7 orthodontic wire between teeth 53, 52, 51, 61 and 62.

One day after the trauma, a panoramic X-ray was performed to assess the supporting tissues and diagnose the slight intrusion of the deciduous tooth with the permanent tooth in formation. The radiographic examination did not observe interference of the involved teeth with the successor permanent teeth germs (figure 2).

In the 2nd week, the orthodontic wire was removed and splinting was performed with fluid resin, which was maintained in the 2nd and 3rd weeks. After 21 days, the dental immobilization was removed and

Figure 2. Panoramic X-ray 1 day after the trauma did not reveal interference of the involved teeth with the germs of the successor permanent teeth.

the child underwent clinical and radiographic follow up appointments (figure 3). The 30-day radiographic control did not reveal any abnormality in the repair process of the supporting tissues. The 120-day radiographic control showed an acceleration of the rhizolysis process of teeth 52 and 61 (figure 4). Due to the extent of the trauma and involvement of the buccal bone plate, a quarterly follow-up appointment with the patient was suggested until the exfoliation of the permanent teeth was achieved.

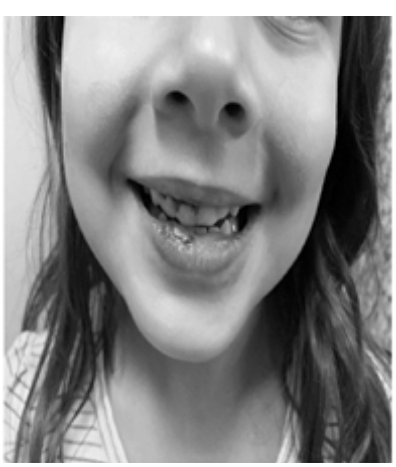

Figure 3. Splitting with fluid resin in the second and third week.

After 18 months, the deciduous central incisors were found to be in apex relationship. In addition, a buccal displacement of the crown of element 11 that started its eruption buccally, as well as a lack of space for its rupture, can be observed. For this reason, the patient was referred for orthodontic evaluation and follow-up. They arrived for orthodontic treatment with a slightly convex profile, facial symmetry, and a

Figure 4. X-ray at 120 days showed an acceleration of the rhizolysis process of teeth 52 and 61.

normal smile line. Upon intra-oral examination, mixed dentition was observed with the presence of erupted dental elements 31 and 41.

In the upper arch, a space was observed between teeth 61 and 62. On the right posterior side, the patient had a mesial step. In the incisors, however, a top relation was observed. From the left intraoral view, the patient presented a straight terminal plane on the distal surface of the deciduous second molars. Dental elements 46 and 36 were breaking. There was a deviation of the upper dental midline to the right.

In the skeletal diagnosis, conducted by Steiner's cephalometric analysis, the patient presented an ANB angle of 5.99º, characterizing as class II for mandibular retrognathia. In addition, an increased SnGoGn angle with a value of 38.27º was present, revealing an increase in the vertical dimension. In the lateral teleradiograph, the vestibule version of the crown of tooth 11 was observed. In the panoramic radiograph performed with the mouth half open, the rotation of teeth 45 and 35, in addition to the displacement of the germ of tooth 11, was observed. The lack of space for the rupture of tooth 11 can be noted. After the orthodontic evaluation, rapid maxillary expansion (RME) (figure 5) and subsequent traction of element 11 (figure 6) were proposed.

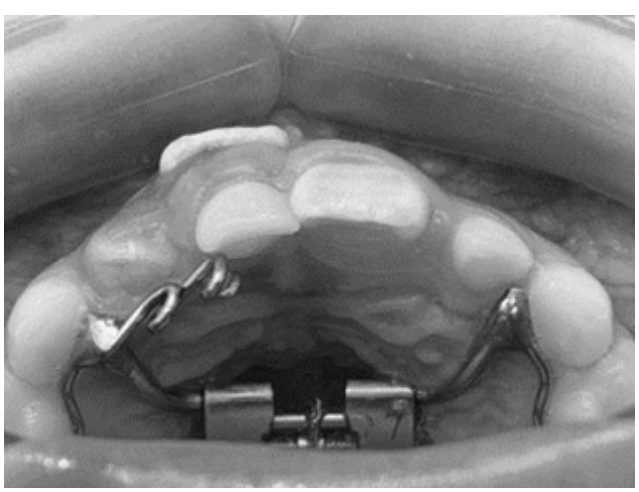

Figure 5. After 18 months of trauma and orthodontic evaluation, rapid maxillary expansion (RME) was proposed. Buccal displacement of the crown and lack of space for element 11 to break.

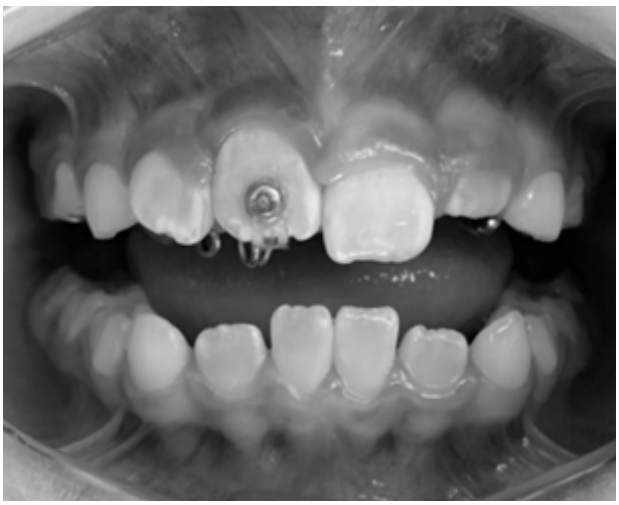

Figure 6. After the ERM, the traction of element 11 was performed.

DISCUSSION

The need for clinical case reports is a way for professionals to discuss and evaluate the various options for action and prognosis related to trauma in the primary dentition [7,12].

The trauma described in this article can be characterized as a fracture of supporting tissues with involvement of the alveolar bone and periodontal ligament, according to the classification by Andreasen and Andreasen (1982). This classification is also used by the World Health Organization (WHO), which favors standardization in the diagnosis and analysis of the different types of action reported in the literature [5,13]. Regarding the clinical examination for cases of lateral dislocation, a displacement to a position different from the physiological axial position is notable and, when this sharp movement occurs, disruption to the alveolar bone plate is expected [5]. According to Costa et al. [8], in their study on clinical and radiographic sequelae in deciduous teeth affected by dental trauma, 55% of patients who suffered lateral dislocation after trauma had clinical sequelae, among which the most frequent were color change and abnormal positioning. The follow-up of the clinical case showed a change in the position of the germ of the permanent successor of tooth 51. Cases of lateral dislocation present a considerable risk of pulpal obliteration [6,14,15], emphasizing the importance of a long-term follow-up; therefore, the patient in this reported case was monitored for 18 months.

The importance of anamnesis in several cases of trauma is highlighted. It is extremely important that the person responsible is able to inform the professional of when, where and how the trauma occurred in order to reach a correct diagnosis for a successful treatment. The clinical aspect of trauma with abundant and profuse bleeding can mask health aspects that are more relevant to the maintenance of life [14].

In lateral dislocation trauma, radiographic examination is a complementary and fundamental examination for correct diagnosis and follow-up of the clinical case. The radiographic image must clearly encompass the area of the lesion and show an enlargement of the periodontal space [15-18]. It is common for pulp obliteration or even pulp necrosis to occur during the follow-up of cases in which this dislocation occurs [6]. For monitoring and evaluating pulp vitality, clinical examination and pain history are fundamental. Pulp vitality tests that consider pain as a response are not objective and may cause pain to the child, requiring clinical and radiographic follow-up for the correct pulp diagnosis [5].

The treatment carried out in this clinical case took into account the magnitude of the displacement, the degree of development of the tooth and its relationship with

the permanent germ, the period of time since the trauma, and the degree of cooperation of the child with the suggested treatment, according to recommendations in the literature [3,17].

In this clinical case, the patient sought treatment within the first hours after the trauma, as is recommended. Therefore, initially, the replacement was performed under local anesthesia, with bidigital compression of the tooth, which can also be done with the aid of forceps. In cases where the tooth is mobile, flexible, or semi-rigid, containment is indicated for 10 to 14 days, with mobilization after lateral dislocation injuries being of paramount importance to keep the traumatized tooth in the correct position, facilitating the alveolar bone process and healing of the periodontal ligament. If incisal wear is indicated after repositioning to identify the presence of occlusal interference, as performed in the reported case [17]. Those responsible for the child were instructed to provide a light diet, with soft foods at room temperature. It is recommended to restrict the use of pacifiers and bottles, but this patient did not use these items [17].

If the displacements are of great intensity or towards the germ of the permanent tooth, extraction is the most appropriate treatment [16,17]. The greatest risk of alteration in the development of the permanent successor tooth is when the root apex of the deciduous tooth moves in the apical and lingual or palatal direction, invading the follicle [2,19]. In this clinical case, there was no invasion of the follicles of the permanent tooth, which allowed for splinting and using the teeth as anchorage for bone repair.

The fracture that occurs in the bone plate is classified as a Greenstick fracture. It is an incomplete fracture in which the bone is “chipped” or “cracked”, with one side of it remaining intact. This type of fracture is commonly seen in younger children who have a thin cortical layer, bone that is spongier and filled with various developing tooth germs, in addition to smaller paranasal sinuses. All these factors help with protection, reducing the chance of facial fracture after impact [20,21].

This type of fracture that occurred was decisive for the decision to reposition the bone and enable its repair by repositioning and splinting the teeth.

Believing in a better prognosis, antibiotic therapy was prescribed. However, the literature is not unanimous about the use of antibiotics and the improvement of the prognosis of the tooth that has suffered dislocation, leaving the prescription of this medication at the discretion of the physician or dentist, and it is important to consider the systemic conditions of the patient [5].

The patient arrived at the office on the day of the trauma with edema, fear and stress. In addition to the physical impact, there are several consequences that trauma to the primary dentition can cause for the patient, such as an emotional and psychological impact, providing the dentist with not only the important role of clinical intervention in cases of dental trauma, but also the role of informing those responsible about the importance and prevention of dental trauma.

The treatment does not only involve emergency intervention; the patient must also undergo radiographic clinical follow-up and control after 30, 60 and 120 days, as well as annually, until the exfoliation of the permanent tooth [22-24]. During this time, one can follow the rhizolysis process, the control of pulp vitality, and the development of the permanent successor germ and its eruptive path [25]. An alteration in the development of the occlusion was observed (bite on the top and atretic upper arch) and the monitoring of the establishment of normal occlusion was necessary. We can verify that the health of the child returned aesthetically and functionally.

CONCLUSION

Conservative dental treatment options are encouraged. The alveolar bone could be preserved through a more conservative dental intervention due to the child's good health conditions and the dental care in a short period of time after the trauma.

All cases of dental trauma must be evaluated individually.

An individualized treatment plan based on the history and physical examination of each child is reinforced.

Collaborators

MLMF Fernandes, project administration, formal analysis, conceptualization, writing - proofreading and editing, investigation, methodology, supervision. SCC Cruz, writing- proofreading and editing, research, methodology, supervision. BTT Loureiro, writing- first writing and editing, visualization.

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