Subluxation associated with soft tissue trauma in a pediatric patient: clinical case report

Subluxação associada ao traumatismo de tecidos moles em paciente pediátrico: relato de caso clínico

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ABSTRACT  
Dental traumas are seen in the literature as injuries that are caused by impacts on the teeth and/or hard and soft tissues inside or outside the oral cavity. The objective herein is to report the technique performed at the Amazonas State University on a 3-year-old patient, who had necrotic tissue in the anterior region of alveolar and gingival mucosa, due to trauma suffered in this region 14 days previously. Radiographically, the dental elements showed no impairment. First, scraping of necrotic tissue was performed, which resulted in severe exposure of periosteal tissue, followed by tissue synthesis by suturing and the application of surgical cement for the purpose of cicatricial stimulation. The elements 51 and 61 presented mobility, thus semi-flexible containment were performed for stabilization of the elements. The follow-up was carried out over a period of 12 months, and it was concluded that the therapeutic approach was the correct one for the case of dentoalveolar trauma as described above. Emphasis of the importance of the collaboration of those responsible for the child’s oral hygiene and good immune response of the patient resulted in an effective treatment with favorable outcome.  

Keywords: dental trauma, primary teeth, periodontium.  

RESUMO  
Traumas dentários são vistos na literatura como lesões causadas por impactos nos dentes e/ou tecidos duros e moles dentro ou fora da cavidade oral. O objetivo aqui é relatar a
técnica realizada na Universidade do Estado do Amazonas em um paciente de 3 anos de idade, que apresentava tecido necrótico na região anterior da mucosa alveolar e gengival, devido a trauma sofrido nessa região 14 dias antes. Radiograficamente, os elementos odontológicos não apresentaram comprometimento. Primeiramente, foi realizada a raspagem do tecido necrótico, que resultou em exposição grave do tecido periosteal, seguida da síntese tecidual por sutura e a aplicação de cimento cirúrgico com a finalidade de estimulação cicatricial. Os elementos 51 e 61 apresentaram mobilidade, sendo realizada contenção semiflexível para a estabilização dos elementos. O acompanhamento foi realizado ao longo de um período de 12 meses, e concluiu-se que a abordagem terapêutica era a correta para o caso de trauma dentoalveolar, conforme descrito acima. A ênfase na importância da colaboração dos responsáveis pela higiene oral da criança e boa resposta imunológica do paciente resultou em um tratamento eficaz com resultado favorável.

Palavras-chave: traumatismo dentário, dentes primários, periodontium.

1 INTRODUCTION

Dental traumas (DTs) are recognized in the literature as injuries that are caused by impacts to the teeth and/or hard and soft tissues inside or outside the oral cavity. They are usually caused unexpectedly and accidentally, and emergency care is required for affected patients (Lam, 2016). These can happen at any time and require correct training for the manipulation of the tooth, since the prognosis of the case is strongly associated with this factor (Alnaggar, 2015). They can affect children, adolescents and adults, but are more common during childhood, occurring quite often in children up to 12 years of age (Lima, 2017). Statistically, the male gender is the most affected by dental traumas. In addition, enamel fractures may occur, followed by dentin and enamel and crown fractures, with enamel fractures being the most prevalent in children from 8 to 10 years (Freire-Maia, 2018). On the other hand, there are lesions, such as concussion, subluxation, lateral dislocation, intrusion, extrusive dislocation and avulsion, in the supporting tissues (Andreasen, 2011).

Subluxation is a periodontal ligament injury caused by an impact of considerable degree that leads to rupture of the main fibers of the periodontal ligament. The tooth becomes loose, but does not move, and there is usually bleeding in the gingival sulcus.
Pulp necrosis may occur due to a lesion associated with innervation and irrigation of the pulp, especially in teeth with complete apical development (Alejandra, 2021).

The choice of procedure to be performed in such cases directly interferes with the results of treatment. It is important that not only does the dental surgeon (DS) have knowledge and skills, but also, parents and teachers must have basic knowledge on how to act in these cases when they occur at home or at school (Zaleckiene, 2014).

Traumas are unexpected situations that can emotionally affect parents, teachers, caregivers and/or guardians, leaving them with many doubts as to how to proceed and what consequences may occur. Unfortunately, there is little information on what attitude they should take in an emergency involving the teeth (Zaleckiene, 2015). A study conducted in 2019 by Servat et al. revealed that most parents never received guidance on how to proceed in the case of a trauma, which reveals the need for educational measures and guidance that can clarify doubts and generate confidence in them to correctly deal with such situations.

After the trauma, it is necessary to observe the condition of the dental support tissues and adjacent elements, in addition to the degree of root development of the traumatized element(s). The time elapsed from trauma to care will dictate how the treatment will take place. The application of fixation when necessary is done as a maneuver to reduce the sequelae caused by trauma (Prado, 2018).

Traumatic injuries to the deciduous teeth and, consequently, soft tissue injuries have a varied etiology; up to 5 years of age, falls from their own height appear as the most common in the literature, and are usually common domestic accidents in this age group. In general, only one tooth is affected and there may still be multiple injuries according to the age of the child. However, as the child acquires new skills, new and different risks arise, which may vary between falls, animal bites, cycling accidents, sports activities, traffic accidents, in addition to ill-treatment, which are also a cause of trauma (Zaleckiene, 2014; Figueiró, 2016). Thus, this article aims to report a clinical case of dentoalveolar trauma in the supporting tissue of a pediatric patient.
2 CLINICAL CASE REPORT

When attending the pediatric dentistry clinic of the State University of Amazonas, the patient C. E. R. (3 years of age) presented with his parent who reported the dental trauma of his son about a week before the initial consultation, reporting that the child had suffered trauma while on the toilet. Clinically, the anterior maxillary region presented with extensive necrotic tissue, elements 51 and 61 presented slight mobility, which indicated subluxation, and X-rays confirmed proximity of the subluxation to the permanent tooth germ was noted, but no alterations were observed.

Figure 1: Occlusal X-ray indicating absence of alterations.

Source: Prepared by the author.
None of the information obtained from the anamnesis was outside of the standards of normalcy, and, after explanations were given to the parent about the procedure, and the need for physical contention, a local anesthetic (Lidocaine 100 mg/mL) with epinephrine) was applied using regional infiltrating and blocking techniques in the area to be worked on.

For the elimination of the focus of infection, curettage of the necrotic tissue with periodontal curettes and constant irrigation with a saline solution was performed. The scraping procedure resulted in severe exposure of periosteal tissue, thus, we proceeded with the synthesis of soft tissues present in the area and application of surgical cement. This had the purpose of cicatricial stimulation and protection of the area against excessive touching by the child. Antibiotic (amoxicillin 250 mg/mL) was prescribed for 5 days and anti-inflammatory (ibuprofen 100 mg/mL) for three days.

The caregiver was instructed to provide liquids and soft foods for the child and care for possible recurrent traumas and hygiene with careful brushing and cleaning with chlorhexidine 0.12% with the aid of gauze. Since there was no occlusal contact, occlusal relief was not performed.
Figure 3: Clinical appearance after scraping of necrotic tissue, resulting in periosteal exposure.

On the 7th day after the initial care, in the consultation for suture removal, increased mobility was noted in elements 51 and 61, and we decided to use semi-flexible containment to stabilize the elements. Orthodontic wire (0.6 mm) was used for stabilization, with angular modifications in order to avoid stimuli from movement.
Figure 5: Semi-flexible containment performed for stabilization of elements 51 and 61.

Source: Prepared by the author.

After two weeks, the stabilizing procedure had concluded, and resulted in a clinical aspect with constant tissue neoformation and the absence of mobility. The radiographs indicated an absence of periapical lesion, integrity of the periodontal ligament space, presence of lamina dura surrounding the alveolus, and no obvious signs of reabsorption. Gingival retractions could be observed, probably due to the repair not being performed nearer to occurrence of the trauma. The follow-up was carried out over a period of 12 months, with quarterly frequency.
Figures 6a and 6b: Radiographic aspect two weeks after containment installation (6a) and radiographic aspect after one year of follow-up (6b)

Source: Prepared by the author.

Figure 7: Clinical appearance after one year of follow-up.

Source: Prepared by the author.
3 DISCUSSION

Traumatic injuries in early childhood have a significant prevalence, as has already been pointed out in some studies. In 2015, Rouhani et al. published the results of a sectional study that indicated the high prevalence of dental trauma (22.9%), with luxation being the most common type of trauma. There are reports in the literature that cite that the upper central incisors are the deciduous elements most often involved in dental traumas (Lam, 2016; Zaleckiene, 2014; Da Silva, 2021). This is a similar result (81.1%) to that of the study published in 2014 by Vuletic et al. and is corroborated by the case presented in this paper.

Due to the proximity of the dental structure, soft and supporting tissues are almost always involved in the DT’s clinical picture. Of the 128 patients who received treatment in the study by Vuletic et al., 55% had their DT associated with soft tissue injuries. Injuries involving the supporting tissues require repair of the organism, the first 24 hours being the most important for the remediation. The absence of the care protocol increases the chance of inadequate repair of the periodontal ligament, which may result in gingival recessions; like the case in the present study (Issao, 2013).

The standard protocol proposed by Andreasen in 2007 consists of gingival repositioning with the aid of suture threads, prescription of antiseptic solution and removal of the suture after 7 days. For this reason, immediate and correct treatment becomes essential. The justification of the protocol is due to the possible displacement of the gingival mucosa to the bottom of the sulcus, which may cause subsequent gingival retraction, a protocol used in this case (Andreasen, 2007). Subluxation is a trauma of low to moderate intensity, where the rupture of some fibers of the periodontal ligament occurs and leads to mobility without, however, causing dental displacement (Viana, 2019).

Cunha et al. (2011) showed that the frequency of parents seeking care 24 hours after trauma is high, and that 22.7% of the evaluated cases were registered only 3-15 days after the traumatic event. In contrast, Silva et al. (2019) states that 68.8% of parents would take their children for emergency care within 30 minutes of the trauma and 7.1% would only take their children after the first day, after the child calms down. It is important to keep in mind that there is a strong relationship between DT and the repercussions related
to root reabsorption in the deciduous tooth or involvement of the permanent tooth germ in formation, when intrusive, lateral dislocations or avulsions are involved (De Amorim, 2011).

In addition to the dental structures, there is a consensus regarding the observation of signs such as unconsciousness, headache and amnesia, which may indicate the occurrence of skull and central nervous system trauma, and, as such, may compromise the patient’s life; thus, the patient should be referred to the specialist medical care (Issao, 2013; Andreasen, 2007).

The literature reports that there is a high incidence of DT observed in children aged 0-3 years, for reasons, in consensus, such as learning to walk and lack of reflex and protection (Andreasen, 2007; Silva, 2019; Malmgren, 2012). The place where the trauma occurred indicates the need to administer medications, and the validity of the tetanus vaccine should be checked in case of contaminated injuries. In the case of previously immunized patients (over 10 years before DT), a booster dose is indicated. In non-immunized patients, passive immunization should be provided.

According to the DT guideline of the International Association of Dental Traumatology, the use of antibiotics in fractures that are exclusively dental is limited because there is no scientific evidence in favor, but since DT can be accompanied by tissue laceration that may require surgical intervention, the use of this drug class is the responsibility of the clinician who handles the case. In the present case, antibiotic use was justified by the place of occurrence of the lesion, followed by intervention in periodontal soft tissues and anti-inflammatory drugs to control pain (Malmgren, 2012).

Studies have shown that most of the traumatized deciduous teeth presented late sequelae after curative therapy, which indicates the need for a dentist or pediatric dentist with knowledge about the immediate injuries caused and possible future complications to carry out the appropriate diagnosis and treatment (Costa, 2016; Cunha, 2017). Traumas, especially the most severe, need to be followed up, especially with radiographic monitoring to stop silent sequelae that may occur early (Santos, 2010; Wanderley, 2014).

The success of the treatment of dental trauma begins from minutes after the accident and depends on the correct conduct of the emergency assistance provided. In
addition, a thorough anamnesis and intra and extraoral examinations performed by the dental surgeon should also be performed. Therefore, the success is associated with emergency assistance provided in the first moments after the accident (Albuquerque, 2014).

4 CONCLUSION

The sequelae of traumatisms can be exacerbated depending on the initial approach used. Gingival retractions, extensive dental mobility can be avoided when treatment is carried out immediately. The monitoring of the condition is of paramount importance because it is a supervised evolution of the treatment performed in each patient. This follow-up can, when done at the indicated periodicity, reverse serious sequelae if alterations are identified during the evolution of the repair of the traumatic injury.

After the 12-month follow-up, it was concluded that using correct approach in dentoalveolar trauma, in association with the collaboration of those responsible and good immune response of the patient’s organism, resulted in an effective treatment with a favorable outcome.
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