

Failure in Child Tooth Avulsion Treatment: A Case Report

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ABSTRACT

Objective: this article aims to demonstrate the approach of a dental alveolar trauma in which dental reimplantation was performed in the Unified Health System ("Sistema Único de Saúde - SUS") and referred for long-term follow-up in a University Dental Clinic of Northeast Brazil. **Case report:** a 7-year-old male patient, referred to the Dental Clinic of Universidade Tiradentes for long-term follow-up of a dental reimplantation of element 11. During the clinical examination, a severe degree of tooth mobility can be observed, in addition to presence of fistula in the gingival mucus line of the tooth. Radiographically, thickening of the periodontal ligament and areas of extensive external resorption were observed. The follow-up of the case lasted approximately 1 year. **Conclusion:** thus, it is essential that the dental surgeon professional has knowledge for the correct diagnosis and agility in this urgent treatment, in order to preserve the dental organ in the oral cavity for a longer time.

Keywords: Tooth avulsion; Dentition permanent; Dental occlusion traumatic.

Introduction

Dental injuries are characterized as one of the major causes of emergencies in clinical dental practice.¹ They usually occur in childhood and adolescence, and are prevalent in young people of school age, with etiology of falls, automobile and motorcycle accidents, physical aggression and sports practices.^{2,3} Consequently, the most affected teeth are the upper central incisors, the upper lateral incisors, and the lower incisors.⁴⁻⁶

In early childhood, between 1 and 8 years of age, such damage can affect school behavior and progress, and influence the quality of life of the children their caregivers. Dental injuries most often affect males because they participate in more aggressive activities and contact sports.⁴ Given the complexity of approaching patients with dental trauma, it is essential to perform a very detailed anamnesis to determine the appropriate treatment plan and prognosis.^{7,8}

Alveolar dental trauma corresponds to a set of impacts that affect the teeth and their support structures. The most frequent lesions in deciduous dentition are dislocations and avulsion, and in permanent dentition crown fractures. Avulsion is the most common type of trauma and can be characterized as an injury of varying severity, intensity, and extent, which corresponds to complete expulsion of the tooth out of the socket.⁹ In this trauma, the periodontal ligament is severed with or without alveolar bone fracture.¹⁰

The length of time the dental element remains outside the mouth, the storage process after trauma and the root development state will establish different therapeutic options.¹¹ All treatment aims at revascularization of the tooth and maintenance of viability of periodontal ligament cells.¹⁰

In this sense, this article aims to demonstrate the approach of a dental alveolar trauma in which dental reimplantation was performed in the Unified Health System ("Sistema Único de Saúde - SUS") and referred for long-term follow-up in a University Dental Clinic of Northeast Brazil.

Case Report

A 7-year-old male patient attended the Odontopediátrica Clinic of Universidade Tiradentes in July 2019, after 07 days of avulsion trauma with the main complaint: "tooth left his mouth after a bicycle accident". The person responsible for the child reported that the patient was taken to the Emergency Hospital of the State of Sergipe. The treatment was carried out after 02 hours of the event, where a dental replantation was performed of the No. 11 with sutures in the region of the lower groove and referral to specialized treatment.

During the anamnesis, the caregiver reported that the child did not have underlying pathologies or allergic sensitivity. In intra and extra-oral exams, replanting of unit 11 was observed, in which it was pink color, with grade III mobility and outside the occlusal plane (Figure 1A). Periapical radiography showed thickening of the periodontal ligament and incomplete rhizogenesis in units 11 and 21 (Figure 1B).

After analyzing these data, discussions were held with professionals in the endodontic area and it was decided to preserve Unit No. 11, due to the presence of incomplete rhizogenesis and the child's age. In addition, school activities were guided or eliminated for a period of 15 days, avoiding new traumas and the consumption of pasty and reduced foods.



Figure 1. Figure 1A: Dental element 11 with presence of grade III mobility, pink color, outside the occlusal plane and presence of suture at the bottom of the vestibule. Figure 1B: Periapical radiography of units 11 and 21 with incomplete rhizogenesis and thickening of the periodontal ligament of unit 11.

In the second session, a semi-rigid containment was performed with 0.7 mm orthodontic steel wire and composite resin chosen by the color selection. It was used for the first right lateral deciduous molar (54) until the left lateral deciduous first molar (64), due to grade III mobility (Figure 2); then, the sutures were removed with topical anesthetic, in addition to the prescription of Amoxicillin 250mg / 5ml every 8 hours, for 5 days, since there was a fistula at the bottom of the vestibule. In order to monitor the case with a return every 15 days, it was decided that the semi-rigid containment should continue to be maintained, since as the Unit No. 11 was still mobile.



Figure 2. Semi-rigid containment in unit 11.

At each new return visit to monitor dental trauma, periapical radiographs and discussions were performed with other specialists who continued to choose to preserve the dental element. Other procedures were performed during these intervals, such as prophylaxis, control of dental biofilm, topical application of fluoride, application of sealants in posterior units, atraumatic restorations with glass ionomer (Atraumatic Restorative Treatment) and tooth extraction. The semi-rigid retainer, installed in April 2019, remained fixed for 3 months (Figure 3A) and, after removal, it was observed that the mobility of the unit No. 11 became grade II and had a normal color.

In July 2019, it was verified through radiography, that unit No. 11 still found the mobility process incomplete and the mobility degree II (Figure 3B). Thus, following the guidelines, the professionals decided to continue with the preservation of this unit and its monitoring.

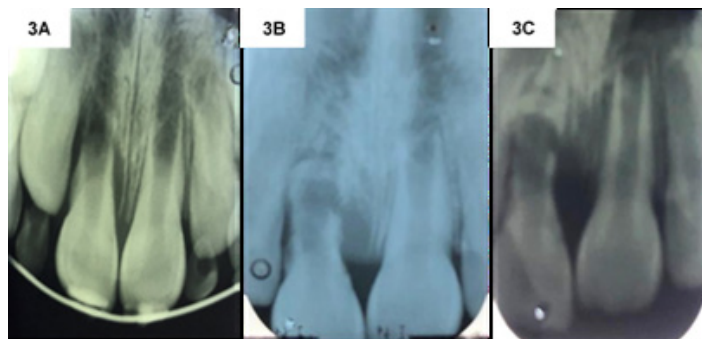


Figure 3. Figure 3A: Periapical radiography of units 11 and 21 with semi-rigid contention and incomplete rhizogenesis (April /2019). Figure 3B: Periapical radiography of units 11 and 21 with incomplete rhizogenesis and radiopaque thickening of the periodontal ligament (June/2019). Figure 3C: Presence of extensive external resorption in unit 11 in the periapical region of teeth 11 and 21 (September / 2019).

In September 2019, new periapical radiography revealed extensive external resorption and the presence of grade II mobility (Figure 3C). It was clinically possible to observe dental element 11 still in the occlusal plane, with the presence of fistula in the region of the gingival line (Figures 4A and 4B). Together with an endodontist, we opted for extraction of the unit, since it was no longer viable in the presence of the same oral cavity for the reasons mentioned above.



Figure 4. Figure 4A: Dental element 11 in position outside the occlusal plane. Figure 4B: Presence of a fistula in the vestibular region corresponding to tooth 11.

An anatomical modeling was performed before the exodus to make the maintainer of the aesthetic space with a tooth in the composite resin. Then, the extraction of element No. 11 was performed under closed technique, topical anesthesia and infiltrative anesthesia with 01 tube of 2% lidocaine with adrenaline 1: 100,000, prescription of ibuprofen 50 mg/ml oral suspension (Figure 5A, 5B and 5C).

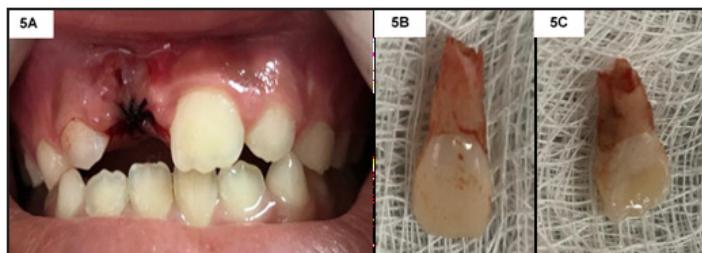


Figure 5. Figure 5A: Suture after extraction of unit 11. Figure 5B: Vestibular face of element 11 with the presence of root resorption. Figure 5C: Palatal surface of element 11 with the presence of root resorption.

In the subsequent consultation, the suture was removed and the orthodontic appliance was installed with an aesthetic space maintainer, with a spare tooth, followed by guidance for its use and reinforcement for the need for future replacement (Figures 6A and 6B).

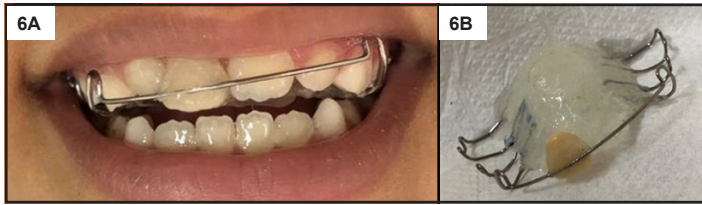


Figure 6. Figure 6A: Installation of orthodontic appliance with aesthetic space maintainer with composite resin tooth in unit 11. Figure 6B: Orthodontic appliance with aesthetic space maintainer with composite resin tooth in unit 11.

Discussion

The prognosis of teeth involved in trauma is multifactorial. One of the aspects that stand out most in the treatment of traumatized teeth is emergency care. When performed correctly, it can lead to a reduction in the damage suffered, as well as limiting the emergence of possible complications.¹² However, in the present clinical case, the patient was treated at an emergency unit and only after one week sought specialized care at the University Dental Clinic, which contributed to a worse prognosis of this case.

During the first call, some specific points should be evaluated, such as the precise diagnosis, time elapsed from trauma to care, conditions under which the supporting tissues are present, systemic medication adopted, reduction and immobilization in the dislocation, and avulsion processes.¹³

After traumatic dislocations or permanent teeth avulsions, as demonstrated in this clinical case, they must be repositioned and reimplanted and subsequently undergoing the immobilization process. When stable in function position, traumatized teeth showed less frequency of resorption, periodontal fiber organization, and blood vessel proliferation within the periodontal ligament.⁷

One week is enough time for periodontal support formation to hold an avulsed dental element in place. Immobilization can be removed within one to two weeks after the accident, according to the International Dental Trauma Association protocol.¹⁴ This data does not corroborate the case report cited, since the avulsed unit remained mobile one week after the accident. Another unfavorable aspect that occurred in the present case was the long stay of unit 11 outside the mouth, since the recommended for a favorable prognosis is a maximum of 30 minutes. However, this factor alone was not enough to lead the case to failure, since other factors, such as the permanence of the tooth in an inadequate storage medium, late immobilization, and unspecialized management to maintain the periodontal ligament, also contributed to the failure of treatment.

According to the American Endodontic Association¹⁵ (2004), root resorption is a condition associated with physiological and pathological processes that result in loss of dentin, cementum and alveolar bone. According to the mechanism of occurrence, it can be classified into inflammation and replacement, which are the most serious complications after dental trauma, often leading to loss of the dental element. As was observed in the clinical case mentioned, there was external root resorption, and after that, loss of the dental unit.

In addition to resorption, the main sequelae of dental replantations are pulp necrosis, root canal obliteration, chromatic alteration, and dental infra-position.¹⁶⁻¹⁸ In the clinical case reported, no sequelae other than external root resorption were observed.

The patient's age and the degree of tooth rhizogenesis are also important factors to be considered at the time of replantation. In young patients (8 - 16 years), reimplanted teeth are lost between 3 and 7 years, because the dentinal tubules are wider, which allows greater access to microorganisms. Moreover, these patients have a higher bone remodeling activity, which favors the faster onset of the resorption process.¹⁹

The need for endodontic therapy depends on the length of the extraoral stay and the stage of root development¹⁵. The success or failure of the prognosis is dependent on rapid and immediate conduct at the scene of the accident, which rarely happens due to the lack of knowledge on the part of those responsible for the child, as observed in this case. It is important to emphasize the need to develop educational programs that highlight the importance of prevention and the benefits of prompt treatment. The use of mouthguards in sports wearing seat belts and early orthodontic intervention is the main prevention methods.¹³

Finally, it is worth mentioning that it is important that the dentist has good general knowledge and technical capacity, being able to face unexpected cases of dental trauma. A good history and clinical examination are also essential for a good diagnosis followed by a good treatment plan. The prognosis may involve other dental specialties and is often doubtful, regardless of reimplantation and immobilization, as there is still a risk of failure.

Conclusion

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