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AVULSION OF DECIDUOUS TEETH AND PREPARATION OF AN AESTHETIC-FUNCTIONAL APPLIANCE: CASE REPORT

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Abstract: Trauma in the primary dentition is a relatively common occurrence, children are always eager to explore the world around them, a condition inherent to the process of psychic and motor development, sometimes without the perception of the danger they are running. Tooth avulsion is a situation where, as a result of trauma, the tooth is completely displaced from its socket, resulting in the total rupture of the apical vascular-nervous bundle and the fibers of the periodontal ligament. The teeth most often involved are the upper incisors. Due to the close proximity to the permanent dentition, reimplantation is contraindicated, at the risk of damaging the developing germ. Possible esthetic damage has been reported as a major concern for parents after early loss of anterior primary teeth. Aesthetics, with clear and evident repercussions on the psychological issue, is of great importance for family members and for the children themselves, as everyone recognizes teething as a fundamental component of appearance. In this way, the present study describes the behavior after avulsion of the maxillary central incisors in a 3-year-old child, who when seeking care, the reimplantation maneuver was not performed. After 7 months, the treatment option, to minimize the effect caused by the missing teeth, was the creation of an aesthetic-functional appliance, in order to improve the quality of life of the little patient.
Keywords: Tooth avulsion. deciduous tooth. space maintainer.

INTRODUCTION

Trauma to the primary dentition is a relatively common occurrence. During these traumas, the anterior teeth are preferentially affected, and since they are responsible for esthetics, mastication, phonation and their loss results in the installation of deleterious habits, it is essential for the clinician, specialist or not, to be well prepared to recognize the different types of trauma[6,10,13].

Children are always eager to explore the world around them, a condition inherent to the process of psychic and motor development, sometimes without realizing the danger they are running. Children who belong to the "risk group" for dental trauma are those aged between 1 and 3 years old, where falls from their own height can occur and the child still does not have the reflex to protect himself. Regarding the teeth most affected in trauma episodes, the maxillary incisors stand out as the most commonly involved. [1,2,4,5].

It is also noteworthy that traumas tend to predominate when the child starts to get up alone, to walk, to run, to try to be independent, but still without motor coordination that allows precise and safe movements.[1,3,5,6]. Due to the resilience of the alveolar bone, dislocations are more common than coronary fractures. Among the dislocations that affect the deciduous teeth, avulsions appear with a prevalence that varies from 7 to 19%[1,5,10-15].

Avulsion, also called exarticulation or total dislocation, is the total displacement of the tooth out of its socket. Tooth avulsion, a complex type of injury, causes rupture of the periodontal ligament and the nerves and blood vessels of the pulp tissue in its most apical portion. In addition, bone tissue can be affected and often the germ of the permanent tooth is affected at the time of trauma.[1-3,5,13-15]

The loss of deciduous teeth caused by trauma is a dramatic experience for the child with great physical and emotional impact, thus making it a great challenge for the professional, as it not only requires a perfect management of the behavior of the small patient at this time, but also knowledge technical, scientific and common sense to make a correct diagnosis and be able to determine an efficient treatment[14-15]

Every case of trauma must be seen as an emergency situation, that is, the diagnosis and the institution of adequate treatment must be immediate, as the prognosis will often depend on the time elapsed between the occurrence of the injury and the execution of the treatment.[4,5-14].

Every child related to traumatic injury of the primary tooth is much more important than his own tooth, just as the involvement of the permanent tooth germ is also more important than the injured primary tooth[2,4]. These issues are often difficult to understand for both parents and children, who at the time of the accident have as their main concern the possibility of losing their tooth. [13-18].

In the psychosocial context, aesthetics has a direct relationship with self-image and self-esteem, influencing the child's emotional development. Early loss of primary teeth, with subsequent esthetic impairment, can induce behavioral changes and repercussions on social adjustment, factors that must be considered in treatment planning. In this way, professionals must offer psychological support to the child and the family, since traumatic experiences during childhood dental treatments may represent one of the possible origins of fear of dental treatment.[13-14].

A review of the literature regarding treatment options for avulsed primary teeth demonstrates great controversy. If there is agreement regarding the problems related to the early loss of an anterior deciduous tooth, on the other hand, the option for reimplantation is based almost exclusively on non-experimental studies describing clinical cases.[23-26]. As a result, information is limited regarding indications and protocol for reimplantation of deciduous teeth[3].

The contraindications to reimplantation in the primary dentition are essential due to the risk of damage to the developing permanent at the time of repositioning the tooth in its alveolus. [14,27]. Flores[20] (2002) highlights the risks of aspiration, prolonged retention, inflammatory resorption and abscess formation when the tooth is reimplanted, in addition to pointing out that one of the greatest difficulties concerns the lack of cooperation of the child to obtain a dry field, which provides a good fixation of the tooth.

As situations of dental trauma usually affect very young children, the dentist must make use of operative techniques aimed at either maintaining the traumatized tooth in the mouth, or in cases of avulsion, using aesthetic-functional appliances, which are divided into, removable or fixed, functional or non-functional, with the aim of maintaining functions such as: aesthetics, phonetics, chewing, maintenance of arch length, stimulation of growth in the height of the jaws, in addition to preventing poor lingual posture or lip suction through the space left by the teeth, as these habits are harmful to a good occlusion[30].

METHODOLOGY

Thus, the present study aims to describe the avulsion of the maxillary central incisors in a 3-year-old child, who, when seeking care, did not perform the reimplantation maneuver. After 7 months, the treatment option, to minimize the effect caused by the missing teeth, was the creation of an aesthetic-functional appliance, in order to improve the quality of life of the little patient.

CASE REPORT

Patient 04 years old, male, healthy, accompanied by his grandmother, with the following complaint: "I'm worried about his teeth that have fallen out".

During the anamnesis, the patient's grandmother reported that at the age of 3, her grandson had fallen from the sofa with

his mouth against the floor and that at the time of the accident he was using a pacifier.

In the fall, both maxillary central incisors were avulsed. When seeking care at a health center, 40 minutes after the event, the family members were explained about the impossibility of reimplantation due to the probable damage to the successor, in development, during the repositioning of the teeth in their sockets. The parents agreed with the conduct taken. They were then instructed on how to clean the place, as well as diet.

However, after 7 months, the child, previously uninhibited and very communicative, began to show problems in his behavior, avoiding social interaction with his schoolmates. When questioned, he reported that he was the only one in his class who did not have teeth 51 and 61, being often excluded from jokes or even ridiculed. This fact began to generate discomfort within the family and the certainty that something must be done in order to try to replace the lost teeth.

Thus, after a thorough clinical examination and the patient's eagerness to "get back" his lost teeth, it was decided to make an aesthetic-functional appliance. (Figures 1, 2 and 3).

Figure 1 – Intraoral photo in occlusion.

Source: research data.

Figure 2 – occlusal view upper arch.

Source: research data.

Figure 3 – occlusal view - lower arch.

Source: research data.

Periapical (Figure 4) and panoramic (Figure 5) radiographs were also taken).

Figure 4 – Periapical radiography.

Source: research data.

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Figure 5 – Panoramic radiograph.

Source: research data.

After carrying out the clinical and radiographic examinations, the child was molded with consequent construction of the study model (Figure 6).

Figure 6 – Ready models.

Source: research data.

The model was sent to a prosthetist for the fabrication of the aesthetic-functional appliance, which consisted of its structure in an acrylic resin plate and placement of the artificial maxillary central incisors. (figure 7 and figure 8).

Figure 7- Plaster model showing the aesthetic-functional apparatus (Front view).

Source: research data.

Figure 8- Plaster model showing the aesthetic-functional appliance (occlusal view).

Source: research data.

The installation of the aesthetic-functional device was carried out, where the person responsible for the patient was instructed on its placement and removal, as well as on its hygiene. The patient must be evaluated periodically so that the use of the device does not interfere negatively with the normal process of growth and development proper to age. (Figure 9 and Figure 10).

Figure 9- Patient with dental braces installed.

Source: research data.

Figure 10- Patient with dental braces installed.

Source: survey data.

DISCUSSION

The maintenance of deciduous teeth in the arch under normal conditions represents a prerequisite for the performance of their various functions such as mastication, phonetics, swallowing and aesthetics. In addition, the anterior primary teeth serve as a guide for the eruption of the successors. The high prevalence of displacements determines, with some frequency, the early loss of one or more deciduous teeth, which represents evident damages for the traumatized child and for the family nucleus, having a negative impact on the psychological balance of the patient.[5,14-22-25,27].

Multiple injuries that injure 2 or more primary teeth are highly prevalent. This can be explained by the following factors: younger children do not have enough motor coordination to protect themselves at the time of the accident, they have periodontal structures that are more vulnerable to injuries, and deciduous children occupy less space in the arch, in proportion to permanent ones.[1-5,7,13-18]. In the reported clinical case, dental trauma compromised the two maxillary central incisors.

Studies show that in relation to the age and sex of children who are victims of traumatic injuries, boys are generally the most affected and the age group between 1 and 3 years is the most prevalent[1,2,5-8-15]. The child reported in this clinical case is male and at the time of the trauma he was 3 years old.

As the apex of the anterior teeth normally presents a slight buccal angulation, it is necessary that the traumatic force is directed to the palatal surface of the crown for the avulsion of the maxillary incisor to occur. Such a situation would occur with the fall of the child carrying an object in the mouth or in cases of impact on the chin transmitted to the tooth. Slight rotation during avulsion, caused by root curvature, can injure the soft or hard tissues that separate the primary tooth from the successor.13,15,20,21,27-

At the time of the trauma, the patient in the present case was using a pacifier. We believe that this object has contributed to the exarticulation of the maxillary central

incisors. It is also worth mentioning that this situation may have been facilitated by the high resilience and malleability of the children's alveolar bone, favoring the expulsion of teeth from their respective alveoli.[2,4,5-7,14,20,23-].

In avulsion-type trauma, the tooth is displaced completely out of the socket. Often, a periapical radiograph must be performed to ensure that the missing tooth is not intruded.[4,10,13-15-20]. In this case reported, when seeking care, the child's family took the avulsed teeth, ruling out any possibility of intrusive dislocation trauma.

There are controversies regarding the need and advantages of reimplanting an avulsed primary tooth, and we must consider the physiobiological aspects of maintaining space in the anterior segment of the child's dental arch. Avulsed primary teeth must not be replanted due to the potential risk of damage they can cause to the permanent tooth germ.[3,4,5,15,27]. The American Academy of Pediatric Dentistry (AAPD)[28] also does not recommend reimplantation of avulsed deciduous teeth. Such a maneuver is discouraged due to the high possibility of harming the germ.

During avulsion, there are 3 moments in which the permanent successors can be affected: at the time of trauma (in the slight rotation that the deciduous undergoes before leaving the socket), at the time of reimplantation (when trying to reposition the tooth back into the socket) and after reimplantation (due to periapical infections and/or pathological resorptions) 13-14,21,23,27.

It is also worth mentioning that the primary tooth is genetically programmed to undergo resorption (rhizolysis). Thus, in the face of severe trauma, with total rupture of the ligament, when reimplanted these teeth usually respond with a high-speed pathological resorption process or with ankylosis, indicating their early extraction.[14,15,27].

The probable sequelae to the odontogenesis of the permanent successors were decisive in the choice of treatment in the reported clinical case, that is, the option of not reimplanting the avulsed teeth. Parents were instructed on diet and hygiene. It was also explained the little possibility of closing the anterosuperior space, since the canines had already erupted.[13,30].

Dento-alveolar trauma is a very common occurrence in childhood and often results in esthetic impairment of the tooth. Appearance is recognized as being fundamental to lifelong social interactions. Dental aesthetic changes, such as those caused by dental injury, can cause changes in children's behavior, altering their social interaction with peers, negatively interfering with their emotional development.[13,30].

When looking, 7 months after dental trauma, for dental care, the main complaint of the child's parents was exclusively aesthetics. They reported that their son was suffering from the absence of teeth 51 and 61, as he was the only one not present such elements. The child was not willing to attend school or socialize with his peers.

In view of the above, the premature loss of anterior deciduous teeth requires considering the possibility of placing devices that replace lost teeth, in order to solve or at least reduce the resulting damage.

Aesthetic-functional appliances are prosthetic devices, fixed or removable, which aim to reproduce a pleasant aesthetic, restore functions and, eventually, maintain space. The choice of device must be carried out based on a detailed study of each case, looking for devices that present the greatest possible number of requirements to fulfill their functions. Its indication is subordinated, in addition to the factors previously discussed, to the interest of those responsible for the replacement of lost teeth.

Since its manufacture may require complex clinical maneuvers and its maintenance in the arch involves some specific care, the collaboration and motivation of parents and/or guardians are essential.[11,12,16,17,30].

This way, the professional must be prepared to make use of resources that restore the lost balance, without interfering with the normal processes of growth and development typical of age. Any clinical maneuver in this sense must be subject to a thorough examination, in order to provide the most accurate diagnosis possible.[9,24].

Removable aesthetic-functional appliances are a kind of alternative for children with more than one tooth loss and emotional maturity to accept the use and care inherent to this type of appliance. As for age, it is reported that from the age of 3, children accept the removable prosthesis well, probably because of their interest in seeing their physical and emotional integrity restored.[19,22,29,30].

In the reported clinical case, it was decided to manufacture an aesthetic-functional removable device, which would solve the child's problem, restoring his self-esteem and enabling him to return to social life without embarrassment.

FINAL CONSIDERATIONS

Dental trauma in children aged 1 to 3 years commonly occurs due to the fact that they are learning to walk and discover everything around them, and are therefore more prone to falls. Tooth avulsion is a common event in early childhood. The loss of anterior primary teeth is a dramatic experience for children and their families, with great physical and emotional impact.

Due to the proximity between the dentitions, reimplantation is not indicated as this maneuver can produce defects in the odontogenesis of the developing permanent. Maneuvers to minimize the effects of early loss of the deciduous tooth can be performed, such as the manufacture of aesthetic-functional appliances, in order to recover the child's self-esteem, improving the child's quality of life.

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ANNEX A - FREE AND CLARIFIED CONSENT FORM

CONCESSION TERM FOR ACADEMIC PURPOSES

PATIENT NAME:_____
Medical Record No.: 2746

NAME OF THE RESPONSIBLE (in case of a minor patient):

This term refers to the granting by the patient or guardian legal, full rights of retention and use of data from the anamnesis, physical examination, radiographs, models, drawings, results of clinical and laboratory tests, and any other information relating to diagnosis, planning and treatment that constitute your personal data collection for the following educational purpose(s) and scientific improvement:

- Presentation at scientific conferences
- Presentation at academic seminars
- Completion of course work

The information obtained through the granting of data did not allow the identification of the patient's person, except for those responsible and the disclosure of the mentioned information will be made among professionals studying the subject.

In case of agreement, all ethical principles will be respected, and the at any time, the patient may withdraw this consent, without this bring any penalty or damage.

It should be noted that treatment not linked to agreement with this term and if the patient or legal guardian does not agree, his treatment will be carried out in the same way, following the treatment plan, without any kind of damage.

The patient or legal guardian must sign the chosen option below

I DO NOT AGREE ( ) I AGREE (X)

_____

Signature of the patient or guardian

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