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## Avulsion of primary teeth - a case report

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**ABSTRACT:** Avulsed primary tooth is totally dislodgement from the socket and require prompt recognition and treatment. A 3-year old girl visited Department for preventive and pediatric dentistry within the University Dental Center Ss. Pantelejmon in Skopje, due to a tooth injury in the upper jaw after falling during walking at home yard. The injury happened the day before, so the time taken from the injury to the arrival of the pediatric dentist was more than 24 hours. The girl did not have any signs or symptoms of neurological damage. After obtaining accident history and performed clinical examination and X-ray the diagnosis of complete traumatic dental avulsion 61 was made. The teeth was transported in a glass bottle with physiological solution. According to the guidelines of the International Association of Dental Traumatology, replantation of deciduous teeth is contraindicated because it can cause a number of complications. Avulsion as a dental trauma injury leads to premature loss of primary incisors thus causing numbers of short- and long-term sequelae on the life of the child. Therefore, the role of the pediatric dentist is very important, who should manage these injuries well and should give advice and support to the parents and manage the child constantly and accordingly in the post-traumatic period.

**Keywords:** Avulsion; Primary incisors; Dental trauma.

### 1. INTRODUCTION

Traumatic dental injuries will rank fifth if it was included in the list of the world's most frequent acute/chronic diseases and injuries. Traumatic dental injuries diagnosis is not standardized around the world. Many authors consider that traumatic dental injuries are neglected condition [1, 2]. Avulsed teeth are totally dislodged from the socket and require prompt recognition and treatment in the emergency department.

When the teeth erupt (traumatic tooth extraction extrusion dentis complete, exarticulatio, avulsion, luxatio complete dentis), an empty alveolar cup is observed, which is confirmed by X-ray. It is the rarest of all luxation injuries. The most common erupted teeth are the central incisions in the upper jaw. In order the reimplantation to be successful, it is necessary to meet certain conditions: the alveolar cup not to be much damaged, the time during which tooth was out of the mouth to be as short as possible (not more than 2 hours),

the avulsed tooth no to have painful pulp and orthodontic contraindication for replantation not to exist [3]. Avulsions were observed in 6.5% of children included in the prospective study involving approximately 20,000 children in the age group 1–8 years in Norway [4].

It has been observed that this kind of injury most often occurs at the age of 2-3 years, while the child is in the phase of learning motor movements, and the second most common period is 6-10 years, which is a period of eruptive phase of permanent incisions [3].

Taking in context the fact that this injury can happen anywhere, the child can be with or without parents or in school or kindergarten, teachers and nurses in kindergarten need to be prepared and aware of what to do in that situation. They must be sober, not to panic, to see what type of injuries the child has, whether they are life threatening, whether the child has symptoms of amnesia, whether there is fainting, vomiting, headache, i.e., first to exclude injuries from a neurological point of view.

The best prognosis for reimplantation is 30 to 60 minutes after the injury. The medium used for keeping the avulsed tooth also have a crucial role. It is best to be in a humid environment (saline, water, milk). Saline solution can be obtained by dissolving one teaspoon of salt in 200 ml of water. What we must not do is mechanically clean the surface of the root, because that way we will remove the cells that are important for the tooth to connect with the alveoli. In addition, the tooth must not be dried or transferred to gauze or material. This can lead to dehydration of living root cells that are important for alveolar attachment. Today there are pharmacologically prepared media specifically for avulsion teeth, which in highly developed countries are already used as part of medical first aid.

Replantation of deciduous teeth is contraindicated because it can cause a number of complications. According to one group of authors, the replantation of deciduous teeth is not justified due to the possibility of infection of the jaw of the permanent tooth or the permanent tooth itself.

According to the guidelines of the International Association of Dental Traumatology [5], replantation of deciduous teeth is contraindicated because it can cause a number of complications [6]. According to one group of authors, the replantation of deciduous teeth is not justified due to the possibility of infection of the jaw of the permanent tooth or the permanent tooth itself. The prevalence of avulsion among all other types of dental injuries ranges between 5.8% and 19.4% [7].

## 2. CASE REPORT

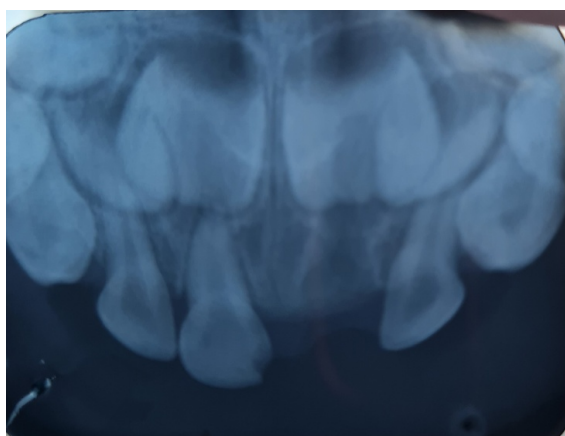
A 3-year old girl accompanied with her mother and grandfather visited the Department of preventive and pediatric dentistry within the University Dental Center Ss. Pantelejmon in Skopje, due to a tooth injury in the upper jaw after falling during walking at home yard. The injury happened the day before, so the time taken from the injury to the arrival to the pediatric dentist was more than 24 hours. The girl did not show any signs or symptoms of neurological damage. After obtaining accident history and performed clinical examination (Figure 1) and X-ray (Figure 2) the diagnosis of complete traumatic dental avulsion 61 was made. The teeth was transported in a glass bottle with physiological solution.

Authors obtained the Ethics Committee agreement for including photos of the child into the article.

The parents of the injured child received instructions and directions regarding the play and the hygiene of the teeth in the post-traumatic period. The patient has been monitoring on regular checkups scheduled.



**Figure 1.** Traumatic dental avulsion of teeth 61.



**Figure 2.** X-ray of the teeth 51 and empty place of the primary teeth 61.

### 3. DISCUSSION

Avulsion as a dental trauma has serious impact over aesthetical, functional, psychological and economic consequences for both patients and their children. Many studies conducted on the investigation of the parents' knowledge and possible treatment is inadequate. Also a cross-sectional evaluation of the knowledge about primary dental injuries among Chinese dentists confirmed that it is insufficient and that education of dentists about dental trauma injuries must be enhanced [8]. Many studies have also explored teachers' knowledge of dental trauma and how they would react when it occurred [9, 10]. In his study, Salarić I points out that avulsed primary teeth should not be transplanted, but still 4.31% of the teachers surveyed responded that they would decide to re-implant them, which could result in damage to the the bud of a permanent tooth [10]. The question of whether to reimplant avulsed primary tooth has been a focus of debate and controversy among the experts from the field of pediatric dentistry for many years [11]. Martins Júnior PA in its review paper on the procedures undertaken after avulsion of a primary tooth, points out that if replantation is done there will be no negative consequences in 36.6% of the cases, but still there is no evidence of the justification for replantation in primary teeth [12].

Among the most popular media for the transportation of the avulsed teeth are Hank's Balanced Saline Solution (HBSS), DentoSafe and ViaSpan media for tissue and organ transportation. Such preparations should be available in all places where traumatic injury avulsion can occur, such as gyms in schools, kindergartens, children's playgrounds, sport fields [13]. The literature about replantation of avulsed primary teeth is significantly more limited in comparison with that of a replantation of avulsed permanent teeth [14].

However, the literature describes cases when successful reimplantation was performed in exceptional cases when all the conditions were met and dentists were able to follow the patient for a long time [6, 11]. Kapur et al from Brasil have a positive experience with reimplantation of the tooth after avulsion in a 3-year and 2-month-old female child. An extraoral dry time was 15 minutes, followed by placement of the tooth in the milk by parents and immediate coming to the emergency services at the dental pediatric clinic. The avulsed tooth was rinsed with saline and placed in a tissue culture medium for half an hour. Two treatment options have been offered to the parents from which one was to return the primary tooth in dental socket, followed by immobilization and endodontic treatment of the primary incisor and the second option was to leave the alveoli empty. The parents chose the first offered solution. Eighteen months after replantation mobility of reimplantation teeth increased significantly and intra oral peri-apical radiograph showed that more than half of the root of 61 was weakened the resorption process [15].

Due to the close relationship between the apex of the primary tooth root and the bud of the permanent tooth, many of these avulsions as a type of dental trauma predispose to the developmental irregularities later, hypoplasia of the permanent tooth, discoloration on the enamel of the crown in 30% until 60% of the cases [16].

Esthetics, quality of life, development of oral habits, speech development, arch integrity (space loss), development and eruption of the permanent successors, and eating are potential sequelae that occur as a result of premature loss of primary anterior teeth due to avulsion.

The results of the study conducted within 4,238 children from three clinics near Copenhagen, Denmark showed that the risk of developmental disturbances in the permanent successors is as high as the injury occurred at a younger age of the child. The frequency of avulsion of primary teeth was thirty-five children (0.8%) within all deciduous teeth, but still most frequently the maxillary incisors (89%). The developmental disturbances in the permanent teeth acquired as a result of avulsion of the deciduous tooth are discoloration, hypoplasia and horizontal enamel hypoplasia [17]. Delayed eruption of the permanent successors may also occur [16].

One group of authors from Brazil in their study described the prosthodontics restoration of primary avulsed tooth which is done by using natural primary tooth placed on removable aesthetic space maintainers and evaluated over a 12 month period. Positive side effects of the prosthodontic therapy were that a child has satisfactory aesthetics and masticatory function, possibility for normal development of speech, for maintenance of oral hygiene [18].

#### 4. CONCLUSION

Avulsion as a dental trauma injury leads to premature loss of primary incisors thus causing numbers of short- and long-term sequelae on the life of the child. Therefore, the role of the pediatric dentist is very important, who should manage these injuries well and should give advice and support to the parents and manage the child constantly and accordingly in the post-traumatic period.

**Authors' Contributions:** AV and KT contributed to conception, drafting, and critical revision of the manuscript; TA and FA searched the literature relevant to the work. All authors read and approved the final manuscript.

**Conflict of Interest:** The authors declare no conflicts of interest.

**Ethical considerations:** Authors obtained the Ethics Committee agreement (no. 371) for including photos of the child into the article.

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