

Delayed Replantation of Avulsed Tooth: A Case Report

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Abstract

Case Report

This case report presents of delayed replantation of avulsed maxillary central incisor after an extended dry extra-alveolar period. Eight-year-old girl and presented with avulsed maxillary central incisor due to trauma occurring 4 hours earlier. Treatment guidelines for avulsed immature permanent tooth with prolonged extra-oral time was carried out for the teeth and the extra-oral endodontic treatment was completed. After having been repositioned, the teeth were stabilized for 4 weeks and prophylactic antibiotic was prescribed. Clinical and radiographic controls were done after 9 months. During the follow-up periods the tooth reported in the case have remained in a stable, functional position but revealed clinical initial replacement resorption and ankylosis.

Keywords: Avulsed teeth, replantation, flexible splint, open apex.

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INTRODUCTION

Tooth avulsion is complete displacement of a tooth from its socket and is seen in 0.5–3% of all dental injuries [1-3]. The prevalence of avulsion cases in children increases between the ages of 7 and -9 years due to incomplete root development and minimal resistance of the alveolar bone/periodontal ligament (PDL) against extrusive forces during the eruption period of the teeth [1-3]. Avulsion in primary dentition is typically a result of hard objects hitting the teeth, whereas avulsion in permanent dentition is generally a result of falls, fights, sport injuries, automobile accidents, and child abuse [4-6]. In permanent and primary dentition, avulsion generally occurs in the maxilla, and the most commonly affected teeth are the maxillary central incisors. Increased overjet and incompetent lips were identified as potential etiological factors in such avulsion cases [2-4, 7]. Although avulsion usually involves a single tooth, tooth-supporting tissue injuries, lip injuries, and multiple avulsions have also been documented [8, 9]. The primary goal in treating an avulsed tooth is to preserve and treat the supporting tooth tissues and to replant the avulsed teeth. The success of replantation depends on the patient's general health, the maturity of the root, the time the tooth is out of its socket, and storage medium [10-13]. The period of extra-oral time and the storage medium have the most critical effect on the status of the PDL cells [11-13]. The aim of this case report was to

present a case of delayed replantation of avulsed maxillary central incisor after an extended dry extra-alveolar period.

CASE REPORT

An 8-year-old girl was referred to the pediatric dental clinic after a fall that resulted in dental trauma. The trauma occurred 4 hours ago while the child was playing in the school garden. The child had already been seen by the medical staff of the emergency unit of a local hospital, and no neurological damage or medical complications were detected. Her parents had let the avulsed tooth dry in a piece of tissue and brought it to the clinic. The intraoral examination revealed that the maxillary right permanent central incisor (tooth 11) was avulsed. In a sensibility test, the adjacent teeth gave a positive response. Periapical and panoramic radiographs revealed no alveolar bone wall fracture or other hard tissue injuries. Examination of the avulsed tooth showed that the crown was sound, the root had an open apex, and was covered with dried remnants of periodontal tissue. After informing the patient's parents about possible risks, the socket of the tooth was gently rinsed with a saline solution under local anesthesia (Mepivacaine HCL 3% Septodont). The avulsed tooth's root was cleaned carefully to remove necrotic and dried remnants of periodontal tissue. Extra-oral endodontic treatment was carried out on the tooth, and the root canal was filled with mineral trioxide aggregate

(ProRoot MTA, White, 10x0.5g Brand: Dentsply Sirona) 2 mm plug and Gutta-percha. Glass ionomer cement (3M™ Ketac™ Universal Aplicap™ Glass Ionomer) was used to restore the access cavity temporarily. The position of the replanted tooth was verified both clinically and radiographically. The tooth was stabilized using a flexible splint (0.195-inch round twist-flex arch wires) utilizing the acid-etch composite resin technique. Moreover, oral hygiene instructions and advice about a soft diet and the need to use a chlorhexidine mouth rinse during the stabilization period were provided at this time. Prophylactic antibiotic therapy with amoxicillin was prescribed for one week. The patient was also referred for an anti-tetanus booster. The parents were informed about the importance of regularly returning for clinical and radiographic follow-up.

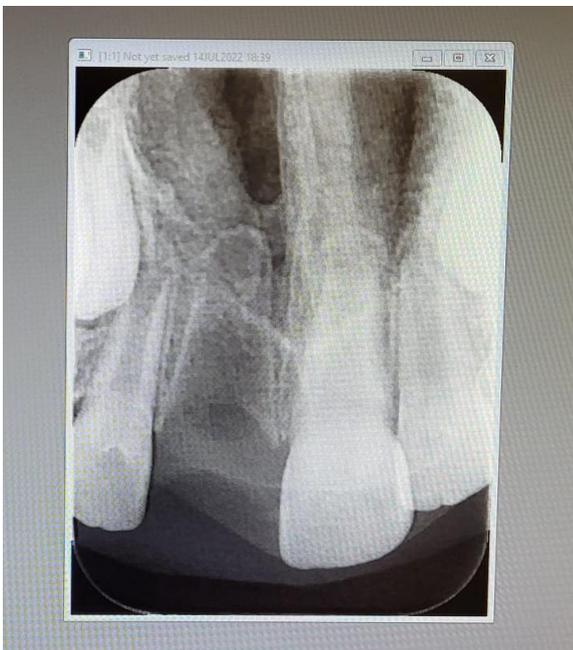
The patient was reviewed after two weeks, and no clinical or radiological pathological changes were detected. The patient was seen four weeks after replantation again, and the splinting wire was removed at this appointment. Re-root canal treatment was also performed at this appointment regarding to loosen Gutta-percha and required more condensation. In the third month follow-up, a percussion test of the avulsed tooth revealed a change in the percussion sound due to ankylosis. During an 8-month follow-up period, the replanted tooth was stable and functional. However, some initial resorption associated with ankylosis, and approximately 0.5 mm supra-occlusion were observed.



Avulsed tooth Upper left incisor 11 saved in dry tissue



Periapical radiograph after immediate replantation of avulsed tooth



Periapical radiograph before replantation of avulsed tooth



Periapical radiograph after re-root canal treatment



Periapical radiograph follow up 9 months

DISCUSSION

In the literature, the guidelines for the avulsed permanent teeth management vary. However, there is a consensus that the immediate replantation in the most ideal treatment for an avulsed tooth for open apex [3, 4]. Clinical studies have indicated that teeth replanted within 5 minutes after avulsion have the best prognosis [12]. In contrary, a dry time of 60 minutes or more is enough for the PDL cells to lose their viability and reduce the general prognosis of the replantation [3, 4]. The storage and transport media during the extra-oral preservation time are also of vital significance. In patients with a prolonged extra-oral time, the tooth should be maintained in a suitable media, such as HBSS, saline, milk, or saliva, until it is replanted by a dentist [12-14]. In the present cases, the teeth were kept in dry pieces of tissue, and the extra-oral dry time was more than 60 minutes (4 hours). The management of the case presented here was in accordance with the accepted replantation protocol described by the International Association of Dental Traumatology [3]. It is, recommended in cases where the avulsed tooth has been dried for more than 60 minutes before replantation to perform root canal treatment extra-orally prior to replantation or later. Because there were no chances of obtaining pulp space revascularization and the periodontal ligament will be necrotic and not expected to heal, it was decided to treat the root canals extra-orally. According to traumatology guidelines and articles on delayed replantation cases, PDL cells will be necrotic following delayed replantation, resulting in a poor long-term prognosis [1, 3, 4, 15]. Most avulsion trauma occurs before the patient's facial growth is completed. Preventing resorption of the surrounding bone and maintaining the tooth in the space of the arch are critical until facial growth is completed [10]. Replantation can restore the patient's esthetic appearance and occlusal function and prevent physiological trauma, which can be associated with a missing anterior tooth. Replanted teeth must be

monitored carefully, and clinical/radiographical findings should be recorded and re-assessed. In children and adolescents, ankylosis is frequently associated with the supra-position of the replanted tooth. The replanted tooth presented here showed signs of ankylosis. Decoronation may be necessary later when the degree of supra-position increases more than 1 mm.

CONCLUSION

Despite an extended extra-alveolar dry storage time, teeth with delayed replantation might remain stable and functional in the dental arch. In patients for whom growth has not ceased, using the replanted tooth to maintain the surrounding bone for a few years until the patient is a viable implant candidate can be considered a suitable therapeutic option.

Conflict of Interests: The authors declare that there is no conflict of interests regarding the publication of this paper.

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