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Delayed replantation of an avulsed tooth after 5 hours of storage in saliva: a case report

CASE REPORT

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Abstract – This article reports a clinical case of a 8-year-old boy, who underwent an avulsion of the upper left central incisor. The avulsed tooth was kept in the oral cavity in direct contact with saliva for 5 h from the moment of trauma until its replantation. Treatment guidelines for avulsed mature permanent teeth were followed. The clinical and radiographic findings after 2 years revealed absence of root resorption, ankylosis or mobility of the replanted tooth.

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Tooth avulsion is the complete displacement of a tooth from its socket due to accidental or non-accidental injuries (1). In these cases, immediate replantation of the avulsed tooth (within 5 min) yields the best results (2). Unless an immediate replantation is possible, avulsed tooth must be stored in special media such as Hank's balanced salt solution (HBSS), milk or saline to keep periodontal tissue under good state until replantation (3, 4). However, factors such as: lack of knowledge of first aid measures among parents and care takers, unavailibility of finding appropriate storage medium at the moment of accidental scenes contribute to a poor prognosis (5–8). Saliva, on the other hand, is always available at the the moment of avulsion injuries and can be used as a temporary storage medium until the tooth is replanted or a more appropriate storage medium is obtained. In the early 1980s, saliva has been investigated as a possible storage medium in comparison to other alternatives (9–13). Today, saliva is recommended as one of the evidence based options for storage (14), however in the dental literature very few cases are reported using saliva as a storage medium (15).

This article reports a successful replantation of an avulsed mature central incisor which was kept in the oral cavity in direct contact with saliva for 5 h from the moment of trauma until its replantation.

Case report

Eight-year-old male patient was referred to Ege University, Dental Faculty, 5 h after trauma. The extraoral examination revealed a swelling of the upper lip. In the intraoral evaluation, it was noted that, the crown of the left maxilllary central insicor was pushed palatally and its root was exposed to the oral environment in direct contact with saliva. The apex of the avulsed tooth was covered with soft gingival tissue. There was no damage noted in the neighbouring teeth but the adjacent cercival periodontal tissue was bleeding Fig. 1. Radiographic evaluation showed that, there was no root or bone fracture and the avulsed tooth was observed to have mature root.

The treatment consisted of removing of avulsed tooth from the soft tissue gently with gauze soaked in saline in order not to damage the root surface. The tooth was kept in saline and replanted after the alveolus was irrigated with saline. The occlusion was checked in order to avoid any traumatic interferences. Subsequently, the tooth was splinted using 0.7 mm orthodontic wire and acid-etch composite resin technique for 3 weeks Fig. 2. A periapical radiography was taken right after the splinting to ensure a favourable position of the tooth in the alveolus. 1000 mg Amoxicilline tablets two times per day for seven days and a chlorhexidine mouthrinse (0.12%) twice a day for two weeks were administered. Soft diet was suggested during the stabilization period. Instructions were given to patient to perform good oral hygiene. Anti-tetanus serum was given prophylactically.

One week after the replantation, the root canal of the avulsed tooth was biomechanically prepared, and a calcium hydroxide paste was used as intra canal dressing at the first recall. Two weeks later, before the

Fig. 1. Avulsed upper left central incisor.

Fig. 2. Splinting of the avulsed tooth with orthodontic wire and composite resin.

removal of the splint, final root canal treatment with gutta percha points and a resin based sealer was completed Fig. 3.

In the second year follow up a periapical readiograph was taken to see the state of the apex of the replanted tooth. The tooth mobility was determined by pushing the tooth in between a tweezer. The tooth showed normal clinical mobility. Subsequently, percussion test was applied revealing no change in the percussion sound in relation to neighboring teeth.

Radiographic and clinical findings after 2 years revealed absence of root resorption, ankylosis or mobility of the replanted tooth Figs 4 and 5.

Discussion

Success of tooth replantation directly depends on extra-alveolar period and storage medium used to preserve the tooth until replantation (16).

The ideal treatment option of an avulsed tooth is immediate replantation so that further injury to periodontal ligament (PDL) cells is prevented and the optimum healing without resorption is succeded (17–20). However, rapid replantation rarely occurs since factors

Fig. 3. Root canal treatment with gutta percha before the removal of splint.

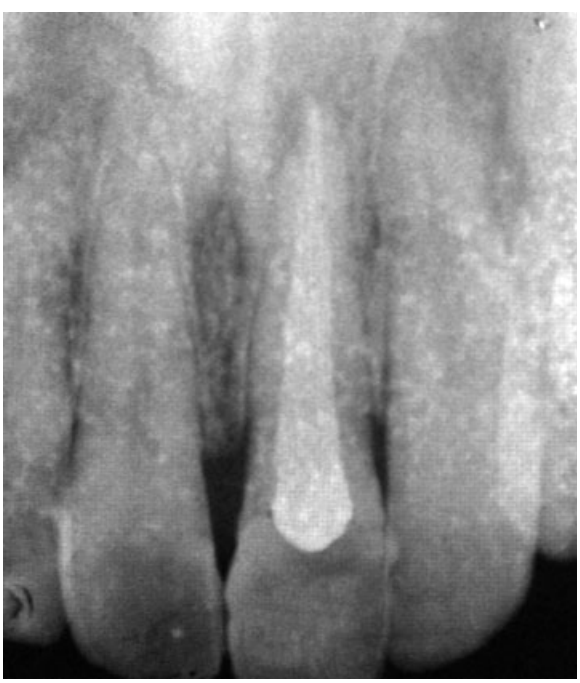

Fig. 4. No pathology and resorption found in 2 years radiographic examination.

Fig. 5. No pathology found in 2 years clinical evaluation.

such as the emotional stress of parents and lack of knowledge of appropriate first-aid measures to manage the problem at the location of the injury. In these conditions the tooth should be maintained in a suitable media such as HBSS, milk, saline, water, culture media or saliva until it is replantated by a dentist. Yet, these storage media are not always available at the scene of injury except for saliva. Despite the fact that saliva has some disadvantages such as low osmolarity and bacterial content, it minimizes the dry storage period and keeps the tooth hydrated (21).

In the present case, although the tooth was out of the alveolus, it remained in the oral cavity in direct contact with saliva. The length of the time elapsed from the moment of trauma until replantation was 5 h. Although this period was not ideal for the healing process of avulsion injuries, a delayed replantation was implemented considering that the avulsed tooth was preserved in saliva.

Earlier studies have shown that the vitality of PDL cells is maintained upon 30 min immersion in saliva and decreases remarkably after 60 min (15, 19, 21). In the case presented, clinical and radiographic findings after 2 years revealed absence of root resorption, ankylosis or mobility which indicates a successful healing process for 21.

During radiographic evaluation, a well defined lamina dura around the root is important to view. Its continuity indicates the healing without root resorption. However, it should also be kept in mind that, identification of its disruption is frequently difficult. This is mostly due to small variations and disruptions in its continuity deriving from superimpositions of cancellous bone and small nutrients canals (22). Clinical tests should also be applied such as mobility and percussion to determine the state of the bone support. The tone of the percussion sound plays an important role in identifying ankylosis thus it requires periodical follow ups in comparison to neighboring teeth.

Immediate replantation of the avulsed tooth yields the best results however if this is not the case, tooth can be kept in saliva. In the case presented, it can be suggested that saliva had a positive effect in avoiding more severe dry out of PDL remnants. It is important to underline the fact that, although root resorption and ankylosis are not observed in 2 years, these events may occur in the long term. Hence, longer period of clinical and radiographic follow up is required.

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