

Reimplantation of avulsed dry permanent teeth after three days: A report of two cases

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Abstract

Two cases of reimplantation of avulsed teeth that occurred after 72 hours are reported. The two patients were male and female aged 13 and 24 years, respectively. The avulsed teeth were not placed in any storage medium for the duration they were out of the mouth and there was no periodontal ligament remaining on their root surfaces before the reimplantation. The teeth in these two patients are still firm without complications after 7 and 17 months. We suggest that the procedures adopted in treating these case should be used by clinicians in treating carefully selected cases that match the cases presented in this paper, which may present to them in their clinics.

Key words: Avulsion, dry teeth, reimplantation, three days

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Introduction

Avulsion is a traumatic injury which results in loss of the tooth from the alveolus, while reimplantation is the technique of reinserting an avulsed tooth into the alveolus or tooth socket after its loss.^[1,2,3,4] The success of reimplantation depends on many factors^[5,6,7] among which are the time lapse before the tooth is reimplanted in the socket^[4,8] and the storage medium of the avulsed tooth.^[9] Other factors which may affect the success of reimplantation include the condition of the tooth, particularly the periodontal ligament tissue remaining on the root surface, sex, age,^[1,2] type of tooth reimplanted,^[2] stage of root formation,^[8] type of cleansing procedure following contamination of the root surface,^[1,2,4] duration of splinting,^[1,2,5] and the use of antibiotics.^[1,2,5,6]

With favorable conditions such as the periodontal ligament remaining on the root surface, the tooth stored in adequate storage medium for not more than 60 minutes, and immediate reimplantation after the accident, the tooth may be retained for as long as 5 to 10 years and few for a lifetime, but some fail soon after reimplantation.^[1-3,6,8]

Unfavorable conditions include teeth out of the mouth for more than 6 hours in no storage media and without periodontal ligament on the root surface. In such cases, the reimplanted tooth fails with subsequent loss of the tooth.^[8,9] This is because dry storage affects pulp revascularization and survival of the periodontal ligament cells along the root surface^[1-3] resulting in either replacement resorption or loss of the tooth.^[2,8,9] Surface resorption is generally diagnosed after 12 months and inflammatory resorption and replacement resorption are usually observed after 1 and 1-2 months, respectively.^[10] However, irrespective of the state of the tooth or time spent out of the mouth, the avulsed tooth that is reimplanted remains the best implant.^[4] However, when endodontic treatment is carried out on avulsed teeth, it improves the chances of retention and prevention of replacement resorption.^[1,5-7] These cases are being reported because the literature search on the subject did not reveal data on avulsed teeth reimplanted after three days.

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Case Reports

Case 1

A 13-year-old boy with a marked skeletal class II pattern walked onto a wall at night after power failure and avulsed his upper left and right central incisors [Figure 1]. The patient presented in the clinic three days later without the avulsed teeth and was advised to look for them. The patient reportedly found the teeth in a dustbin, washed and wrapped them with a piece of paper, and brought them to the clinic the same day. They were soaked in sodium hypochlorite for 15 minutes. Extraoral endodontic treatment was carried out on both teeth and the root canals were obturated with gutta-percha [Figure 2].

Both teeth were then reimplanted and splinted with composite, 0.014" or 0.4 mm hard stainless steel wire, and circumferentially wired with 0.012" wire. The patient was reviewed after one week and although no clinical or radiological evidence of resorption was detected, there was grade 1 mobility of both teeth. A review visit at 12 weeks revealed firm teeth without radiological evidence of resorption or replacement ankylosis [Figure 3]. The patient was advised to seek orthodontic treatment immediately to



Figure 1: Avulsed upper left and right central incisors



Figure 3: Reimplanted teeth after 12 weeks

correct the skeletal pattern. The patient was however lost to follow up.

Case 2

A 24-year-old female nurse patient presented in our clinic three days after her upper left central incisor was avulsed following a road traffic accident [Figure 4]. Clinical and radiographic examinations revealed an empty tooth socket of the upper left central incisor. The avulsed tooth was not placed in any storage medium and was brought to the clinic dry. The patient claimed she found the tooth after three days at the site of the accident.

Extraoral endodontic treatment was carried out on the tooth. The empty socket was debrided and thoroughly irrigated with normal saline before reimplanting. It was splinted with composite and 0.014" or 0.4 mm hard stainless steel wire [Figure 5]. The patient was placed on antibiotics and reviewed after one week. The tooth was not mobile; however, the patient absconded with the splint and was eventually located after 6 months. Clinical and



Figure 2: Obturation of avulsed tooth with gutta-percha



Figure 4: Avulsed upper left central incisor



Figure 5: Splint on avulsed tooth using composite and 0.014" or 0.4 mm hard stainless steel wire

radiographic examinations revealed a firm tooth without any evidence of periapical pathology [Figure 6]. Follow-up reviews at nine, 12, and 16 months showed no mobility or signs of resorption.

Discussion

A review of the literature shows that an extraoral time of less than 15 minutes gives a greater success rate of retention^[9] of reimplanted teeth, but if the time lapse is between 15 to 60 minutes, some authors advise that the tooth must be stored in suitable storage medium and transported to the clinic.^[12-15] Some of the storage media that have been frequently used include Hanks balanced salt solution, modified Eagles solution, Via Span, Euro-Collins solution, Emergency Medical Tooth saver, saline, powdered or pasteurized milk, bovine milk, saliva, or chicken egg white.^[12-15]

Panzarini *et al.*, in a previous study, demonstrated that the average time range of other reimplanted teeth was between 1 to 4 hours, after which the success of reimplantation was determined by the medium of storage.^[11] Success has also been reported in a study where the tooth was reimplanted after 8 hours, but was stored in Euro-Collins solution 15. Studies have shown that even 10 minutes of dry storage results in desiccation of the periodontal ligament cells and eventual loss of the tooth.^[10,11]

Other studies by Day and Duggal showed that reimplantation after 60 minutes in no storage medium with extraoral endodontics may result in retention of the tooth.^[16] However, studies by Petrovic *et al.* showed that reimplanted dry teeth in dry storage between 15 minutes to 9 hours have low survival rates and a reduced chance of retention.^[9] The observation of some clinicians is that if an avulsed tooth is not stored in an adequate storage medium, it invariably leads to necrosis of the pulp, periodontal ligament and cementum, and fails to reimplant.^[11-13] The most practical and available



Figure 6: Reimplanted tooth after 16 months

storage media are saliva and cold milk which could prevent desiccation of the periodontal ligament cells for up to 60 minutes.^[11] However, in these case reports, no adequate storage media were used to keep and transport the teeth to the clinic before reimplantation and the results were successful.

There appears to be no literature on teeth reimplanted after 9 hours, which makes these cases unique and interesting as these teeth were successfully reimplanted after 3 days and are still in a functional state in the mouth of both patients. Reimplantation ensures adequate space maintenance in the arch, aesthetics, function, and prevents psychological trauma, which may be associated with a missing anterior tooth. We recommend that these procedures adopted by the authors in these cases should be used by clinicians in treating such cases that may present in their clinics.

References

1. Andreasen JO, Borum MK, Jacobsen HL, Andreasen FM. Replantation of 400 avulsed permanent incisors. 2. Factors related to pulpal healing. *Endod Dent Traumatol* 1995;11:59-68.
2. Andreasen JO, Borum MK, Jacobsen HL, Andreasen FM. Replantation of 400 avulsed permanent incisors. 4. Factors related to periodontal ligament healing. *Endod Dent Traumatol* 1995;11:76-89.
3. Andreasen JO, Borum MK, Andreasen FM. Replantation of 400 avulsed permanent incisors. 3. Factors related to root growth. *Endod Dent Traumatol* 1995;11:69-75.
4. Marin PD. The avulsed tooth-the best implant. *Ann R Australas Coll Dent Surg* 2000;15:243-6.
5. Von Arx T, Chappuis V, Hanni S. Injuries to permanent teeth. Part 2: Therapy of avulsion. *Schweiz Monatsschr Zahnmed* 2005;115:1057-73.
6. Kirakoza A, Teixeira FB, Curran AE, Gu F, Tawil PZ, Trope M. Effect of intracanal corticosteroids on healing of replanted after extended dry times. *J Endod* 2009;35:663-7.
7. Hinkckfuss SE, Messer LB. An evidence-based assessment of the clinical guidelines for replanted avulsed teeth. Part I: Timing of pulp extirpation. *Dent Traumatol* 2009;25:32-42.
8. Andreasen JO, Borum MK, Jacobsen HL, Andreasen FM. Replantation of 400 avulsed permanent incisors. 1. Diagnosis of healing complications. *Endod Dent Traumatol* 1995;11:51-8.
9. Petrovic B, Markovic D, Peric T, Blagojevic D. Factors related to treatment and outcomes of avulsed teeth. *Dent Traumatol* 2010;26:52-9.
10. Krasner P, Rankow HJ. New philosophy for the treatment of avulsed teeth.

Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1995;79:616-23.

11. Panzarini SR, Gulinelij L, Poi WR, Sonoda CK, Pedrini D, Brandini DA. Treatment of root surface in delayed replantation: A review of the literature. Dent Traumatol 2008;24:277-82.
12. Layug ML, Barrett EJ, Kenny DJ. Interim storage of avulsed permanent teeth. J Can Dent Assoc 1998;64:365-9.
13. Dos Santos CL, Sonoda CK, Poi WR, Panzarini SR, Sundefeld ML, Negri MR. Delayed replantation of rat teeth after use of reconstituted powdered milk as a storage medium. Dent Traumatol 2009;25:51-7.
14. McDonald RE, Avery DR, Dean JA. Dentistry for the child and adolescent 8th ed. CV Mosby Company, St. Louis Missouri; 2000, p. 485-9.
15. Sottovia AD, Sottovia Fiho D, Poi WR, Panzarini SR, Luize DS, Sonoda CK.

Tooth replantation after use of Euro-Collins solution or bovine milk as storage medium: A histomorphometric analysis in dogs. J Oral Maxillofac Surg 2010;68:111-9.

16. Day P, Duggal M. Interventions for treating traumatized permanent front teeth Avulsed (knocked out) and replanted. Cochrane Database Syst Rev 2010;20: CD006542.

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