

Research Article

Avulsion of Three Teeth with Delayed Replantation: A Case-Report

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ABSTRACT:

Avulsion is one of the most common dental incidents in childhood. Avulsion of anterior maxillary teeth in children aged 6-12 is a major problem with serious consequences including delayed bony development and psychological problem for the child. Several factors including extra oral duration, storage environment and alveolar bone fracture affect the prognosis of the avulsed teeth. Immediate replantation of avulsed teeth is of paramount importance and could significantly affect aesthetics, function, bone contour and psychological status of the subjects. In this presentation, delayed replantation of three avulsed anterior maxillary teeth in a 10 years old boy is presented. This report will provide precious information for dentists regarding the importance of immediate treatment of avulsed teeth and different approaches for treatment of these trauma cases.

Keyword:Avulsion, Three Teeth, Delayed Replantation

[I] INTRODUCTION

Avulsion is one of the most common dental traumas with a prevalence ranging from 0.5-18% (1) that could have serious consequences as well (2). Prevalence of dental trauma and avulsion is higher in males in comparison to females and maxillary central incisors are the most common teeth affected. Highest rates of avulsion are observed in the 6-12 years old age range (1,3).

In this age, maxillofacial development is not complete yet and the presence of teeth is essential for the development of alveolar bone. Replantation of teeth immediately after trauma or within 15 minutes post-incident has the best prognosis. However, treatment of choice for avulsed teeth is the immediate replantation in dental socket to maintain alveolar bone development, furthermore, replantation of teeth

significantly affects patients' psychological status even if the prognosis is poor. The most important factor affecting the prognosis of related teeth is the extra-oral duration. In addition, factors such as the storage environment and root development stage and the presence of alveolar fracture also affect the prognosis (1,2). If immediate replantation of avulsed teeth is not feasible, storing in an appropriate environment could affect the prognosis. Suitable transport mediums to maintain PDL vitality are Hank's Balanced solution (HBBS), Viaspan, Milk, Saliva and saline. However, HBBS and ViaSpan are the most suitable transport mediums to maintain PDL cells vitality (1).

[II] CASE REPORT: The patient was a 9 years old boy with no remarkable medical history with

avulsion of maxillary central incisors and right lateral incisor three days prior to presenting to the pediatric department of Kerman dental school, Kerman, Iran. The three teeth were avulsed following encounter of a feast to the face and teeth were replanted three hours after avulsion and

storage in dry environment by a general dentist and sutured.

Patient's oral hygiene was very poor and replanted teeth were mobile in clinical examination (figure 1).



Figure 1: clinical presentation of teeth at initial presentation.

Initial radiographic evaluation revealed the open apex of avulsed teeth (>1mm)(figure 2.a and 2.b). no alveolar fracture was evident in clinical and radiologic examination.

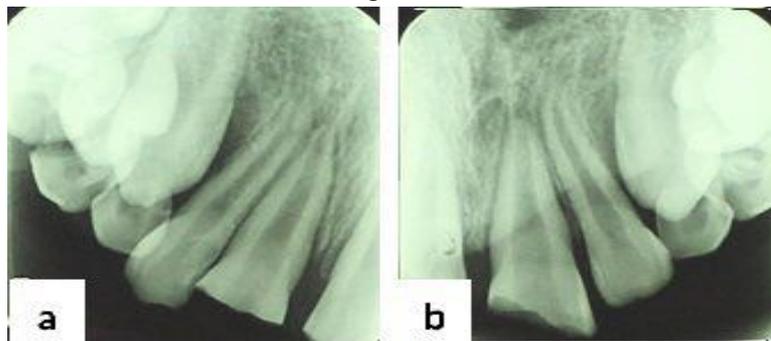


Figure 2: initial radiography of patient after replantation.

Patient's parents were informed of the treatment plan and poor prognosis of the treatment. After clinical evaluation and radiographic evaluation, teeth were rinsed with normal saline and chlorhexidine (0.12%) and debris, plaque and blood clots were removed from the tooth surface.

Teeth were then isolated using rubber dam and teeth were splinted using a 0.7mm steel wire and resin composite and sutures were then removed. Due to the long extra oral duration of teeth storage, pulp vitality was considered negative. Thus, an access was made on the teeth and teeth pulp was completely removed. Calcium hydroxide was placed in the canals and canal orifice was sealed with Glass Ionomer (GI).

Patient was advised to maintain a good oral hygiene and amoxicillin was administered to him

for one week. After one week, tooth canals were rinsed with normal saline and a combination of metronidazole and ciprofloxacin (1:1) was placed in the canal with betamethasone ointment to reduce the resorption process in the canals and orifice was sealed with GI.

After three weeks, canals were rinsed and central incisors underwent a revascularization procedure by induction of apical bleeding and placement of CEM at the orifice. Since no bleeding occurred at the apical end of lateral incisor, MTA plug was placed apically and teeth orifices were sealed with GI.

Teeth were restored with resin composite.

The patient did not attend for three months follow up; at sixth month post-op, oral hygiene was very

poor and calculus was present in buccal and lingual aspects of mandibular central incisors.

Replanted teeth had no evident mobility and gingival recession was observed in right central incisor.

Radiographic evaluation revealed an external inflammatory root resorption at the distal aspect of right lateral incisor and external replacement root

resorption at the left maxillary central incisor; right maxillary central incisor had no resorption radiographically.

The patient was advised to maintain a good oral hygiene and three months follow ups. At 9, 12 and 15 months post-op, teeth had no clinical mobility and right maxillary central incisor's gingival recession did not progress (Figure 3).



Figure 3: clinical presentation of replanted teeth 15 months post replantation.

In radiographic evaluation, root resorption of the teeth was slowed down and right maxillary central incisor was radiographically normal (Figure 4.a and 4.b).



Figure 4: radiographic evaluation of replanted teeth 15 month later.

[III] DISCUSSION

Replantation of avulsed tooth is the treatment of choice, even if the prognosis is doubtful or questionable. Long term success is evaluated by PDL repair presence and root resorption with development of root apex in immature teeth. Long term prognosis of delayed replantation is poor due to the death of PDL and tooth pulp cells (1). Patient should be informed of the prognosis, its complications and treatment goals. The objective of delayed replantation is to restore the tooth role in dentition to maintain aesthetics, function and bone contour and improvement of psychological status of the patient (2,4).The expected result is ankylosis and replacement resorption of the root (2). In the present case, poor prognosis of the

avulsed teeth was explained to the parents and after obtaining an informed consent regarding the advantages and disadvantages of the procedure, revascularization was performed for central incisors and apical plug was placed for lateral teeth. External cervical and apical root resorption due to the bacterial invasion and pulp inflammation are the most common complications of this treatment (3); if the teeth are stored in sodium Fluoride for 20 minutes, the resorption progress would significantly slow down (2). Unfortunately, root resorption was observed in lateral incisor which could be due to the long duration of replantation and bacterial invasion through gingival crevice due to the poor oral hygiene. Despite this, clinical status of the tooth

was acceptable. In cases with extra-oral time more than 60 minutes or evidences of pulp necrosis, RCT is indicated. The risk of inflammation could be reduced by placement of antibiotics and corticosteroids inside the tooth canal (2). In cases with open apex nonvital teeth, RCT, apical plug or revascularization are indicated (5). Revascularization of nonvital teeth is performed by preparing the root canals with minimal instrumentation, rinsing with chlorhexidine, hypochlorite sodium and placement of three antibiotics inside the root canal (Metronidazole, ciprofloxacin and minocycline) for three weeks to disinfect the root canal (3). After this, root canal is rinsed with normal saline and canals are dried with paper point and apical bleeding is induced with an endodontic file. The induced blood clot is covered by MTA, Biodentine or CEM and sealed with GI and the tooth is restored.

In the anterior teeth, minocycline could be replaced with cephalexin due to the risk of discoloration. In this procedure, an scaffold is made through blood clot which provides a proper environment for revascularization and tooth root development (2,5). In this case, bethametazone was added to the antibiotic mix to reduce the chance of inflammation. Success is evaluated through root development evaluation (5). In this case, root development was acceptable in all three replanted teeth despite root resorption and gingival recession. Revascularization had a better outcome in comparison to the apical plug.

Maintenance of a good oral health affects the prognosis (2). In the present case though the oral hygiene was not suitable despite all the instructions. This could justify the gingival recession observed at the teeth. Psychological status of the patient and his parents was improved in the follow up sessions which highlights the importance of replantation of avulsed teeth, even with a poor prognosis, on psychological well being of the patients. Parents were informed of the implant treatment plan after age 18 years old. Presentation of this case provides useful information for the importance of on time

treatment of avulsed teeth and different approaches to these patients.

[IV] CONCLUSION:

The shorter the replantation time, the higher the chance of tooth survival due to the vitality of PDL and pulp cells. Despite poor prognosis of teeth with delayed replantation, it could provide aesthetic, functional and bone contour development for the patient in his developmental stages. Root development stage is also important in prognosis evaluation, so that revascularization of teeth with open apex could provide better outcomes.

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