

# The Avulsed Permanent Tooth: information for dentists

*If the tooth has been out of the mouth more than 5 minutes it will never be the same again.* That means that if it is put back in it will have to be extracted sooner or later.

## Things that can cause a tooth to fail are:

- Infection can cause the tooth root to rapidly dissolve (months to a year).
- The tooth root can become part of the bone and dissolve slowly (years).
- The tooth root can dissolve just below the crown and snap off (years).
- The tooth can become attached to bone and remain in the same location as the child grows. During adolescent growth the tooth will appear 'shorter' and may later be extracted (years).

## What do we know?

After 5 minutes the damaged periodontal ligament will not produce new periodontal ligament but will heal by other means. Teeth that are so young the root has not fully formed have very poor survival prospects (months to a year). Dentists can prevent infection by completing root canal treatment before replantation. Adults over 18 have better prospects for extended tooth survival than preadolescents (years).

## Responsibilities of the dentist

Determine the extra-alveolar duration and storage conditions  
Inform patient/parent of the prospects/outcomes of replacing the tooth  
Attempt to replant the tooth if the patient/parent/caregiver requests  
Prevent/control infection  
Splint the tooth and remove the splint at the appropriate time  
Begin/complete root canal treatment

## Responsibilities of the patient/parent/caregiver

Allow radiographs for diagnosis of damage  
Decide if the tooth should be replanted or left out of mouth  
Cooperate for replantation/splinting/root canal treatment  
Comply with instructions if antibiotic coverage is required  
Return for post-operative splint removal/radiographs at the times described by the dentist before replantation (splint removal at less than 2 weeks or at 2 months depending upon treatment objectives and radiographs at that time, 6 months and then yearly)

## Presentation of avulsed/replanted teeth,

### Scenario A

< 5 min. extraoral duration, immediate replantation at site of accident.

### Scenario B

< 5 min. dry, with storage less than 30 minutes in physiological medium such as normal saline, milk or patient's own saliva

### Scenario C

All cases not included in A and B

## Acute management (Scenario A)

Administer local anesthetic.

Adapt light (0.14" to 0.16") orthodontic wire or other splint material to the arch to include 2 or more stable teeth on each side of the replanted tooth (teeth). If permanent lateral incisors are absent or loose and primary canines are present, the splint may include both primary canines and first primary molars.

Reposition the replanted tooth to the wire and attach it last if required.

Verify the position of the tooth with 2 radiographs taken at different angles using a Rinn holder.

Antibiotic therapy is not routinely required. If elected, use a single oral dose of amoxicillin, 50mg/kg to a maximum of 2 grams or, if sensitive/allergic use oral clindamycin, 20 mg/kg to a maximum of 600mg. A 0.1% oral chlorhexidine rinse is elective for the duration of splint use. If gingival laceration is present, then delay chlorhexidine for 48 hours.

### **Acute management (Scenario B)**

Assess the tooth and socket. Do not replant if the alveolar bone or gingiva are missing or if the root is fractured. Do not replant if patient is immunosuppressed or has other medical contraindications such as cardiac conditions that require IE prophylaxis. ***We caution strongly against replantation of immature incisors with short roots and prolonged extra-alveolar duration.***

Administer local anesthetic.

Gently rinse the tooth with saline or water.

Rinse and suction the clot from the socket. Do not curette the socket.

Replant the tooth firmly into the socket with finger pressure and stabilize by having the patient bite on a wax wafer.

Adapt light (0.14" to 0.16") orthodontic wire or other splint material to the arch to include 2 or more stable teeth on each side of the replanted tooth (teeth). If permanent lateral incisors are absent or loose and primary canines are present, the splint may include both primary canines and first primary molars.

Reposition the replanted tooth to the wire and attach it last.

Remove pulp immediately after replantation and splinting or within 7-14 days

Verify the position of the tooth with 2 radiographs taken at different angles using a Rinn holder.

Antibiotic therapy is not routinely required. If elected, use a single oral dose of amoxicillin, 50mg/kg to a maximum of 2 grams or, if sensitive use oral clindamycin, 20 mg/kg to a maximum of 600mg. A 0.1% oral chlorhexidine rinse is elective for the duration of splint use. If gingival laceration is present, then delay chlorhexidine for 48 hours.

### **Acute management (scenario C)**

Assess the tooth and socket. Do not replant if the alveolar bone or gingiva are missing or if the root is fractured. Do not replant if patient is immunosuppressed or has other medical contraindications (see B above). ***We caution strongly against replantation of immature incisors with short roots and prolonged extra-alveolar duration.***

Rinse the tooth with saline or water. Tooth should be considered a free graft with necrotic cells and desiccated periodontal ligament.

Administer local anesthetic.

Remove periodontal ligament remnants from the root surface with flour of pumice and water slurry (not prophylaxis paste) or instrument, taking care not to damage cementum.

Complete conventional root canal treatment extraorally with gutta percha/sealer including restoration of the crown.

Rinse and suction the clot from the socket. Do not curette the socket.

Replant the tooth firmly into the socket with finger pressure and stabilize by having the patient bite on a wax wafer.

Adapt light (0.14" to 0.16") orthodontic wire or other splint material to the arch to include 2 or more stable teeth on each side of the replanted tooth (teeth). If permanent lateral incisors are absent or loose and primary canines are present, the splint may include both primary canines and first primary molars.

Reposition the replanted tooth to the wire and attach it last.

Verify the position of the tooth with 2 radiographs taken at different angles using a Rinn holder.

Antibiotic therapy is not routinely required. If elected, use a single oral dose of amoxicillin, 50mg/kg to a maximum of 2 grams or, if sensitive use oral clindamycin, 20 mg/kg to a maximum of 600mg. A 0.1% oral chlorhexidine rinse is elective for the duration of splint use. If gingival laceration is present, then delay chlorhexidine for 48 hours.

### **Continuing care (1 to 2 weeks) Immediate replantation: Scenarios A or B**

Teeth with mature apices should have a non-setting calcium hydroxide paste, e.g. Pulpdent®, placed into the root canal as close to the apex as possible.

Complete root canal obturation as soon as possible (14 days) for teeth with mature apices. However, if inflammatory root resorption is apparent, use calcium hydroxide for 6-12 months. Teeth with immature apices must be treated until an apical barrier forms to allow successful obturation (5-19 months). If the pulp is necrotic, perform a pulpectomy and begin apexification with a non-setting calcium hydroxide paste, e.g. Pulpdent®.

Cut the splint wire interdentally and remove the composite resin from all teeth.

#### **Delayed replantation: scenario C**

Cut the splint wire interdentally and remove the composite resin from all adjacent teeth in 2 months.

Remove resin and adherent wire from the replanted tooth at that time.

#### **Continuing care (2 to 3 months)**

Evaluate the state of the tooth radiographically and clinically. If there is radiographic evidence of inflammatory resorption or periapical radiolucency (scenario A & B) place calcium hydroxide and follow the patient until inflammatory resorption and/or periapical radiolucency is resolved.

#### **Long-term sequelae**

The patient and parent will decide if they wish to come back for re-assessment at various periods. We suggest 6m, 12m and annually as a general follow-up sequence.

#### **Outcomes**

*The expected outcome of a tooth that is not immediately replanted is ankylosis, root resorption and eventual loss of the tooth. The prognosis for teeth replanted in preadolescents is considerably worse than for youth who have attained their full growth. Survival in preadolescents is often less than 5 years. Replantation cases are likely to benefit from orthodontic consultation as the patients often have associated malocclusions and choices need to be made for orthodontic or prosthetic replacement. Often replanted teeth are extracted in conjunction with orthodontic treatment.*

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