Avulsed – Tooth Out of Mouth

I. Replantation immediately at time of injury, if possible
   A. Time critical – prognosis dramatically decreases as extraoral time increases.
   B. Instruct patient or parent over telephone to replant tooth immediately at site of injury.
      1. If tooth dirty, rinse under tap water. Do not scrub. Plug sink. Hold tooth by the crown.
      2. Gently tease tooth back into socket.
      3. Patient to hold tooth in socket while being transported to dental office.
   C. When immediate replantation is not possible, place tooth in the best transport medium available.
      1. Hank’s Balanced Salt Solution (H.B.S.S.)
      2. Milk
      3. Saline
      4. Saliva (buccal vestibule)
      5. If none of the above is readily available, use water.
   D. If alveolar fracture, refer to section on Alveolar Fracture.
   E. Management of the Socket
      1. Gently aspirate without entering the socket. If a clot is present, use light irrigation with saline.
      2. Do not curette the socket. Do not vent socket.
      3. Do not make a surgical flap unless bony fragments prevent replantation.
      4. If collapsed alveolar bone prevents replantation, carefully insert a blunt instrument into the socket to reposition the bone to its original position.
      5. After replantation, manually compress (if spread apart) facial and lingual bony plates.
   F. Management of Soft Tissues – tightly suture any soft tissue lacerations, particularly in the cervical region.
   G. Place acid-etch resin arch wire splint for 7-10 days.
   H. Systemic antibiotics for 7-10 days.
   I. Referral to physicians for tetanus consultation within 48 hours.

II. Replantation of tooth with open apex
   A. If less than two hours, replant and do not perform root canal. Recall to check for patosis every 3-4 weeks.
      1. Desire revitalization.
      2. During recalls, if pulp becomes necrotic, clean root canal and fill with Ca(OH)₂ powder.
   B. If longer than two hours dry – within 7-14 days following replantation, clean root canal and fill canal with Ca(OH)₂ powder. (See section on Ca(OH)₂)

III. Replantation with completed root development
   A. Root canal therapy must always be performed.
      1. Remove the pulp in 7-14 days. Thoroughly clean the canal.
      2. Medicate the canal with calcium hydroxide for 1-2 months or until all signs of pathology resolve.
      3. Then, obturate canal with gutta-percha unless complications are apparent.

Ca(OH)₂ Root Canal Filling Technique

I. Exirpate pulp and thoroughly instrument the root canal
II. Fill canal with Ca(OH)₂ powder
   A. Do NOT place Ca(OH)₂ until one week after accident. Earlier placement of Ca(OH)₂ is damaging to healing tissue.
   B. May use dry powder or premixed injection paste.
   C. Some prefer to make a paste of the Ca(OH)₂ with water, saline, CMCP or anesthetic solution.

III. If resorption or patosis is present, reclease and repack the Ca(OH)₂ as necessary

IV. After completion of the above step (III), if resorption is arrested or nonexistent, fill the canal with gutta-percha

Displaced Tooth

I. Time critical – reposition immediately (within 1-2 hours)
   A. Reposition tooth to correct position.
   B. Splint with acid-etch resin arch wire splint for 7-10 days.
   C. Minor displacements of teeth with open apex should be followed closely to determine vitality. Do root canal only if pathosis occurs.
   D. Severe displacements (more than 5 mm) with completed root development require root canal therapy.
   E. If bony involvement, see section on Alveolar Fractures.

Intruded Tooth

I. Open apex – divergent canal
   A. Leave alone if minor.
   B. If severe, can surgically or orthodontically reposition.
      1. May need to perform root canal treatment. If not performed, follow closely and intercept if pathosis becomes evident.
      2. Prognosis guarded.

II. Fully formed root – root canal therapy must always be performed
   A. Reposition surgically or orthodontically.
   B. If surgically repositioned, splint with acid-etch resin arch wire splint for 7-10 days.
   C. Clean canal during first week and fill with calcium hydroxide.
   D. After several months, fill canal permanently with gutta-percha.
Minor Fractures of the Alveolar Process Associated With Traumatized Teeth

I. Reposition bony fragments

II. Splint teeth with acid-etch resin arch wire splint and leave 7-10 days

III. More extensive fractures of the bone require longer splinting periods, usually 2-8 weeks

Fractured Anterior Tooth

I. Pulp not exposed
   A. Temporary seal of dentin with glass ionomer or bonded composite. Important to achieve seal of dentin while avoiding further injury to periodontal ligament.
   B. Restore tooth permanently in 6-8 weeks.

II. Pulp exposed on a tooth with an open apex
   A. Pulp cap with MTA if treatment performed within 3-4 hours after injury.
   B. If massive pulp exposure or exposure over 3-4 hours, perform pulpotomy to maintain vitality to allow root completion. After root completion, perform root canal filling if necessary for restoration procedure.
   C. If pulp necrotic, perform apexification procedure by placing 4-5 mm plug of MTA at apex. Remainer of canal filled with bonded composite or do regenerative therapy.

III. Pulp exposed on a tooth with a fully formed root
   A. Perform root canal therapy if you do not wish to try to preserve pulpal vitality with pulp capping or pulpotomy.

Root Fracture

I. Time critical
   A. Desire to reposition segments as soon as possible and maintain vitality of pulp.
   B. Must achieve repositioning before blood clots.

II. Splint with acid-etch resin arch wire splint for 10-12 weeks

III. Do not perform root canal therapy unless evidence of pulpal pathosis

IV. If root fracture communicates with oral cavity, prognosis is poor for reuniting of segments

The Acid-Etch Resin Arch Wire Splint

I. Orthodontic wire is bent to conform to the facial surfaces of the teeth to be splinted
   A. At least one sound tooth on each side of the displaced tooth or teeth must be included.
   B. Size or shape of the wire is unimportant. Monofilament line may be substituted for wire. Circumferential wire splints are contraindicated.

II. The arch wire is attached to teeth with acid-etch resin
   A. The middle half of the facial surfaces of the teeth are etched with phosphoric acid gel or solution for 30 seconds.
   B. The teeth are thoroughly washed and dried.
   C. The arch wire is attached to the facial surfaces of the teeth with resin.
      1. Any form of resin, composite or light cured resin is acceptable.
      2. Only a small amount of resin in the middle of the facial surface of the crown is necessary to hold the arch wire. Care is taken to avoid contact of the resin with the gingiva.
   D. During attachment of the arch wire, care must be taken to assure that the injured tooth is in the correct position.
      1. A radiograph is taken following placement to verify correct position of the injured tooth.

III. Instructions to the patient
   A. Avoid biting on the splinted teeth. Cut food into bite size and chew on posterior teeth.
   B. Patient instructed in oral hygiene, stressing the importance of brushing and keeping area clean.

IV. Removal of the splint
   A. Drill through the resin and free the wire.
   B. It is not advisable to remove all resin from the injured teeth at time of splint removal.
      1. Excessive manipulation of injured teeth may cause displacement.
      2. Smooth resin and leave remnants for several months.
      3. After the teeth are firmly attached in 2-3 months, the fragments of remaining resin can be removed with a sharp carver or scaler.

Joe H. Camp, D.D.S., M.S.D.
130 Providence Road
Suite 200
Charlotte, NC 28207
(704) 377-1444