ida Times
Indian Dental Association
Mumbai, June 2009
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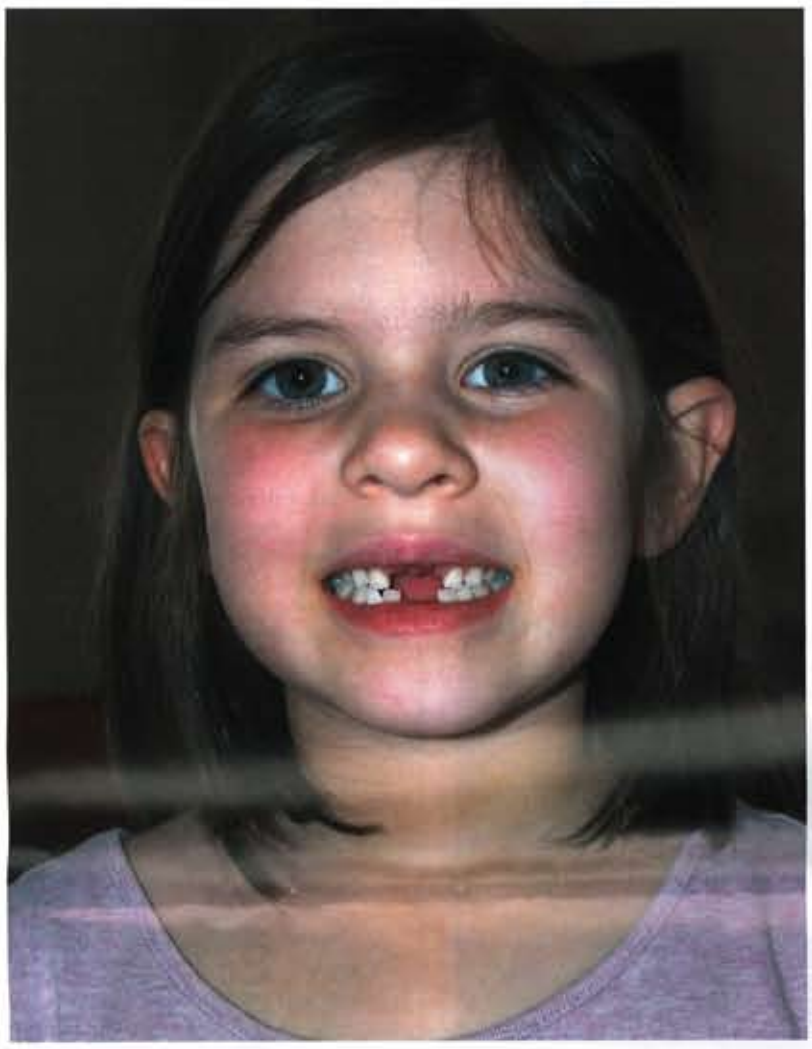
Tooth Avulsion PART III

Clinical Guideline To Dentists & Patients



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Following are the instructions for the accident victim or parent:

1.If the tooth is one of the four front baby teeth (deciduous teeth), there is no need to reimplant it (do not replace it in the socket). Front baby teeth do not hold space for the adult teeth that will begin to erupt at age six, and the early loss of one of these teeth rarely causes harm to the adult dentition.

2.If the root of an adult tooth is broken, (especially if part of the root remains in the socket) reimplantation is not possible. Any attempt will fail. This means that the trip to the dentist, though necessary, may be put off until it is convenient. The only things a dentist can do under such circumstances it to prescribe antibiotics, and to place artificial bone in the socket for possible implant placement at a later date

3.Any avulsed tooth must be reimplanted in the socket within 60 minutes if the reimplantation is to have a reasonable chance of working. This may be done at the site of the accident by any adult including the patient himself provided the tooth is fairly clean and provided it slips back into the socket easily with light finger pressure. If the tooth goes back into its proper position so that the patient may bite down without pushing the tooth out of its normal alignment, then the process has been successful.

- If the tooth is dirty, simply have the patient remove all dirt with their own saliva. Have the patient suck fairly hard on the tooth. Be sure that the patient spits out blood and debris after each sucking action. This removes dirt and will hopefully dislodge any clot that may have formed in the socket making it easier to reimplant the tooth.
- You still must take the patient to a dentist, but the major emergency has been averted and there is less urgency associated with the emergency.
- If the tooth cannot be replaced in the socket (for any reason), then the tooth should be transported to the dental office in a suitable storage medium as early as possible.

Instructions for the dentist

1. If the tooth has been properly replaced in the socket at the site of the accident:

- Do not extract the tooth to treat the root.
- Clean the affected area with water spray, or chlorhexidine mouth rinse.
- Verify proper alignment of the tooth by the following methods:
  – Have the patient bite down and verify that the tooth is not in traumatic occlusion and remains in acceptable alignment with neighboring teeth.
  – Take a periapical x-ray if the tooth is in traumatic occlusion, remove the tooth from the socket and proceed to step 2 below.
- Suture gingival lacerations
- Splint the tooth with (preferably) a flexible splint. Have the patient bite into occlusion to eliminate traumatic bite prior to splinting. The splint will be kept on the tooth for 7 to 10 days.
- Prescribe a suitable antibiotic (doxycycline is ideal).
- Refer to physician for evaluation of tetanus immunization.
- If the tooth has an open apex (blunderbuss) avoids doing a root canal unless an abscess develops or there is radiographic evidence of pulpal necrosis.
- Proceed to the Post-emergency procedures.

2. If the tooth has not been replaced in the socket, or if it must be removed due to traumatic occlusion or misalignment:

- If the tooth has an open apex (not fully formed root)

If the tooth has been out of its socket for much more than an hour, or especially, if the tooth has dried out during transportation, the reimplantation procedure is unlikely to be successful, and the patient or parents should be so informed. It is still permissible to attempt reimplantation since survival is always possible, even if unlikely. It is however unlikely that the root will continue to form its apex and apexification will be necessary. There is also a very substantial chance that the root will experience external resorption or become ankylosed.

The most reasonable course of action is to warn the parents of this outcome and to avoid the procedure altogether. If the tooth has been out of its socket for an hour or less, and has been properly transported to the dental office, then the procedure has a better chance of working. This implies that the blunderbuss root will continue to form an apex and the tooth will continue to erupt normally after the reimplantation procedure.

– Clean the effected tooth with water spray or saline.
– Place the tooth in a solution of doxycycline if available (Low concentration, about 1mgm per 20 cc of saline. Can be made on premises using 1/2 of a 100 mg tablet finely crushed and added to about a liter of saline. In most situations, this step is not especially practical and may be omitted if it is not possible. At wminimum, clean the tooth with copious saline solution. Do not use antiseptic solutions on tooth.
– Irrigate the socket with saline and remove all coagulum.
– Inspect the socket. If bone is displaced into the socket, move it back into position with a suitable instrument in order to allow proper insertion of the tooth.
– Replace the tooth in the socket with minimal digital pressure.
– Suture gingival lacerations.
– Take a periapical x-ray to check root alignment.
– Splint tooth in position with (preferably) a flexible splint. Have patient bite into occlusion to be certain that the position is correct before applying the splint. The splint will be kept in place for about one week.
– Prescribe a suitable antibiotic (doxycycline is ideal).
Refer to physician for evaluation of tetanus immunization.
– Do not perform a root canal procedure unless a post op x-ray shows serious periapical involvement. The idea here is to allow the root apex to form normally. If the pulp dies at any point during treatment, then a root canal procedure with apexification will be necessary.

- If the tooth has a fully formed root (apex)

If the tooth has been out of its socket for an hour or less, and it has been properly handled (as stated above in instructions for patients), the reimplantation procedure is the same as that shown above with the exception of the use of doxycycline rinse. The instructions are repeated below for clarity and completeness:

– Clean the effected tooth with water spray or saline.
– Clean the tooth with copious saline solution. Do not use antiseptic solutions on tooth.
– Irrigate the socket with saline and remove all coagulum.
– Inspect the socket. If bone is displaced into the socket, move it back into position with a suitable instrument in order to allow proper insertion of the tooth.
– Replace the tooth in the socket with minimal digital pressure.
– Suture gingival lacerations.
– Take a periapical x-ray to check root alignment.
– Splint tooth in position with (preferably) a flexible splint. Have patient bite into occlusion to be certain that the position is correct before applying the splint. The splint will be kept in place for about one week.
– Prescribe a suitable antibiotic (doxycycline is ideal).
– Refer to physician for evaluation for tetanus immunization.
– Proceed to post-emergency procedures.

If the tooth has been out of the socket for well over an hour, or if the tooth has been allowed to dry out during transport, the treatment differs from that above mostly because of changes that have taken place on the surface of the root. The following procedure is designed to minimize external root resorption during post operative healing.

– Rinse off all debris from the tooth with copious water or saline.
– Gently and quickly root plane the root of the tooth to remove necrotic periodontal ligament and any foreign debris that has dried onto the surface.
– Immerse the tooth in a 2.4% Sodium Fluoride solution acidulated to pH 5.5 for 5 minutes. This item is rarely found in dental offices today. It has been replaced with various neutralized rinses, gels and foams of lesser concentration. In the absence of the stronger solution, a lesser concentration of fluoride may be used instead. The idea is to convert surface hydroxyapatite into fluoroapetite to reduce external resorption during healing. Keep the tooth in the fluoride solution for a minimum of five minutes; 20 minutes if possible. Wash off the fluoride solution afterwards with copious saline.
– Irrigate the socket with saline and remove all coagulum.
– Inspect the socket. If bone is displaced into the socket, move it back into position with a suitable instrument in order to allow proper insertion of the tooth.
– If available, apply Emdogain to the inside of the socket. This is a specialty item and is not likely to be found in the offices of most general dentists. It has been found to be helpful in experimental situations but no human studies have been carried out to prove its usefulness in reimplantation of avulsed teeth. If available, it may be useful, but certainly not essential.
– Replace the tooth in the socket with minimal digital pressure.
– Suture gingival lacerations.
– Take a periapical x-ray to check root alignment.
– Splint tooth in position with (preferably) a flexible splint. Have patient bite into occlusion to be certain that the position is correct before applying the splint. The splint will be kept in place for about one week.
– Prescribe a suitable antibiotic (doxycycline is ideal).
– Refer to physician for evaluation of tetanus immunization.
– Proceed to post-emergency procedures.

3. Adjunctive treatment and follow-up.

Soft tissue management: Gingival tissue should be tightly secured in the cervical area of the replanted tooth to help prevent the ingress of bacteria. Lip lacerations must be thoroughly cleaned and approximated tension-free before suturing. It is best

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The ida Times
Indian Dental Association
Mumbai, June 2009
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Behaviour and Good Manners ensure success

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to consult an oral or plastic surgeon if the laceration extends through the vermilion border into the skin.

Splinting the tooth: The ideal splint for avulsed teeth is flexible a splint. These are typically made using Gortex or other synthetic cloth or metallic mesh strips made for this purpose. Other types of flexible splint may involve bonded orthodontic brackets and thin orthodontic wire. Ideally, the splint should encompass several teeth on either side of the avulsed tooth.

There are quite a few options depending on the comfort level of the practitioner. The recommendation for flexibility involves theoretical considerations in the formation of the new periodontal ligament. However, since the splint is kept in place for no more than 7 to 10 days, the flexibility factor may be of little practical significance.

The simplest type of splint involves nothing more than a fairly thick strip of light cured composite running across three teeth with the avulsed tooth in the middle. The procedure for upper incisors (the most commonly avulsed teeth) involves having the patient bite into occlusion and keeping his teeth in this position for the entire procedure. This stabilizes the tooth and guarantees that the tooth will not be in traumatic occlusion. The three teeth are pumiced and acid etched. Bond is applied and light cured.

Finally a fairly thick layer of composite is layered over the buccal surfaces of three teeth. Use a color that contrasts with the teeth in order to make removal easier.

In the case of lower incisors, place the splint on the buccal surface if the occlusion permits. Otherwise, place it lingually.

The splint is removed in about a week (10 days tops) and assessed for mobility. If the mobility is excessive, then reapply the splint for another several weeks. Otherwise, allow the tooth to function normally

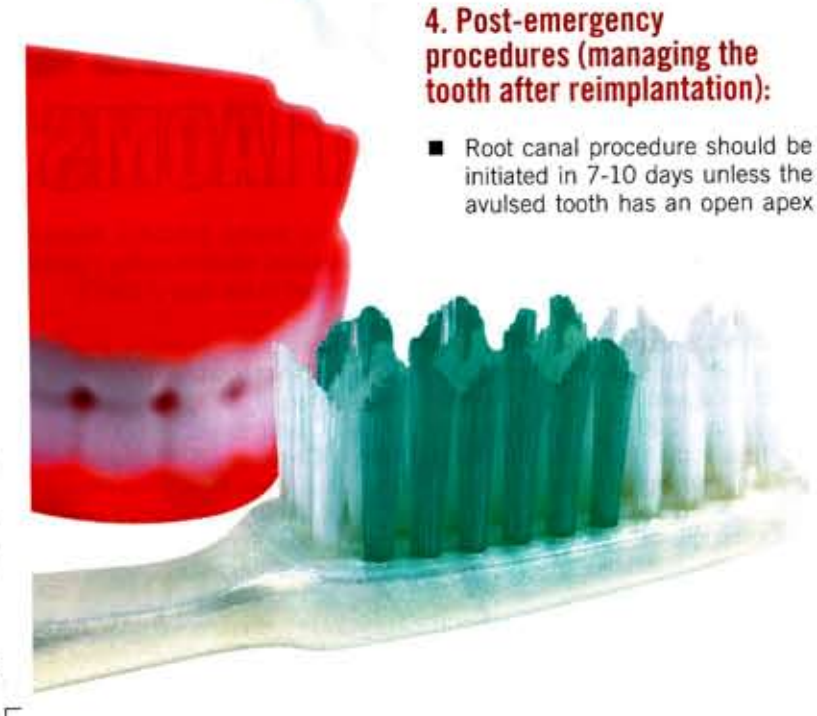
Systemic antibiotics: If the patient is not susceptible to tetracycline staining, the antibiotic of choice is doxycycline at an appropriate dose for patient age and weight. Penicillin V can be substituted for doxycycline. Adult dosage of doxycycline is 100mg b.i.d. x 7 days. Adult dosage of Penicillin V is 1-2g stat, then 500mg q.i.d. x 7 days. Fractures of the alveolus may have their own indications for antibiotic coverage.

Tetanus: Refer the patient to a physician within 48 hours for a tetanus booster if the avulsed tooth contacted soil or if the status of the tetanus coverage is uncertain.

Analgesics: Prescribe if needed. Typically, an over the counter non-steroidal anti-inflammatory drug suffices.

Diet: Post-operative instructions should include a soft diet for 2 weeks. Oral hygiene: Instruct the patient to brush with a soft toothbrush after every meal and prescribe a 0.1% chlorhexidine mouth rinse 2x per day for 7 days.

Follow-up appointments: Include splint removal and initiation of endodontic treatment, if required, at one week. Clinical and radiographic exams should be scheduled at 2-3 weeks, 3-4 weeks, 6-8 weeks, 6 months, 1 year and annually for 5 years.



4. Post-emergency procedures (managing the tooth after reimplantation):

- Root canal procedure should be initiated in 7-10 days unless the avulsed tooth has an open apex and the tooth was reimplanted under optimal conditions.
- The splint should be removed in 7 to 10 days unless the radiograph shows serious bony involvement along the lateral edges of the root.
- If the tooth has a closed apex, or if a tooth with an open apex has obviously abscessed or shown radiographic evidence of pulpal necrosis, begin the root canal procedure prior to removing the splint.
- At this time, instrument the canal completely and place calcium hydroxide paste in the canal. Allow the paste to remain in the canal for approximately a month prior to obturation of the canal.
- The root canal procedure may be completed when an intact lamina dura can be traced all the way around the root. In most cases this will happen within a month. If the lamina dura has not begun to form, or if external resorption is apparent on the radiograph, then the calcium hydroxide should remain in the canal. The status of the lamina dura should be checked one month post op and at three month intervals after that. At the time of the exam, the calcium hydroxide paste should be washed out and replaced with fresh paste.

5. Additional Considerations

- Avulsed primary teeth should not be replanted.
- Avulsed permanent teeth require follow-up evaluations for a minimum of 2-3 years to determine the outcome of therapy.
- Inflammatory resorption, replacement resorption, ankylosis and tooth submergence are potential complications when avulsed teeth are replanted.