TREATMENT RECOMMENDATIONS FOR TRAUMATIC DENTAL INJURIES

Sioux City Dental Society

9 January, 2015

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TREATMENT RECOMMENDATIONS FOR TRAUMATIC DENTAL INJURIES

1. DESCRIPTION

Traumatic dental injuries are categorized into:

- Crown fractures without pulpal exposure (a.k.a. uncomplicated crown fractures)
- Crown fractures with pulpal exposure (a.k.a. complicated crown fractures)
- Crown-root fractures
- Root fractures
- Luxations (concussion, subluxation, extrusive luxation, lateral luxation, intrusive luxation)
- Avulsion
- Alveolar fractures involving teeth

Treatment procedures are initially aimed at stabilizing the injuries to maximize favorable outcomes. Follow-up treatment is often necessary for long term benefit.

2. FRACTURES

Fractures of teeth include crown fractures, combined crown-root fractures, and fractures of roots. Crown fractures such as enamel fractures and crown fractures without pulpal exposure are of concern in children – exposed dentin should be protected as soon as possible to prevent bacterial injury to the pulp. In adults, these fractures rarely require endodontic attention.

Crown fractures with pulpal exposure are of endodontic concern, as are crown-root fractures and root fractures:

2.1 MANAGEMENT OF CROWN FRACTURES WITH PULPAL EXPOSURE

Appropriateness of Treatment: Crown fractures involving enamel and dentin in which the coronal pulp is exposed.

Procedures: In developing teeth, the purpose of treatment is to protect the pulp so that tooth development may continue.

2.1.1 Pulp capping or shallow pulpotomy procedures are indicated. Calcium hydroxide or MTA-type materials should be carefully placed on exposed vital pulp tissue, followed by a protective layer of glass ionomer or similar restorative material.

2.1.2 In fully developed teeth, if prosthetic crowns are not necessary, it is acceptable to use pulp capping or shallow pulpotomy procedures followed by bonded composite resin or bonded fractured crown segment restorations. If crowns are required to restore function and esthetic appearance, root canal therapy is appropriate prior to the restoration.

2.2 MANAGEMENT OF CROWN-ROOT FRACTURES

Appropriateness of Treatment: Fractures involving enamel, dentin, cementum and may or may not involve the pulp.

Procedures: For developing teeth, the need for protecting the pulp is most important. Treatment is often complex and may appropriately require innovative and unusual procedures.

2.3 MANAGEMENT OF ROOT FRACTURES

Appropriateness of Treatment: Root fractures involve cementum, dentin, and pulp and may be horizontal or oblique.

Procedures: Care is directed toward restoring the PDL support of the coronal fragment; the initial treatment is repositioning and stabilization. Reducing the fracture by repositioning the coronal tooth segment must be done first. After reduction the coronal segment must be maintained in its correct position by stabilization for a minimum of 4 weeks; longer time is indicated if the fracture is close to the cervical area of the tooth. Root canal therapy is indicated if the pulp develops infected necrosis and is usually confined to the coronal segment.

3. LUXATIONS

The major concerns with luxated teeth are the potential for pulp necrosis and injury to the PDL which can lead to root resorption. Luxated teeth need to be monitored clinically and radiographically until a definitive outcome can be determined.

3.1 MANAGEMENT OF LUXATIONS

Appropriateness of Treatment: Luxations include slight to severe injuries to teeth and their supporting structures as described below:

- **Concussions** - trauma resulting in sensitivity to percussion but no excessive mobility and no displacement.
- **Subluxation** - increased mobility but no displacement.
- **Extrusive luxation** - partial vertical displacement of tooth out of its bony socket; excessive mobility.
- **Lateral luxation** - displacement of the tooth horizontally; usually the tooth is not mobile.
- **Intrusive luxation** - vertical displacement of the tooth into the alveolar process; the tooth is firm.

Treatment Procedures: Care for luxations includes repositioning (when needed) and non-rigid stabilization to allow re-establishment of periodontal ligament support for the tooth. The usual length of time for splinting is 2 - 4 weeks.

Root canal therapy in teeth with pulpal necrosis or irreversible pulpitis, as established by appropriate endodontic evaluation, is essential for a favorable outcome and prevention of root resorption.

The treatment for developing teeth varies from fully formed teeth, in that efforts must be made to allow revascularization of the developing pulps if they have become ischemic from the injury, while fully formed teeth can receive root canal therapy as soon as pulpal necrosis or irreversible pulpitis has been established. In addition, in the case of intrusion of developing teeth in persons under the age of 15, initial care may appropriately consist of monitoring for re-eruption on a frequent (3-6 weeks) basis.

4. AVULSIONS

Favorable outcomes of replantation of avulsed teeth depend on two factors: minimal extra-alveolar time and appropriate endodontic treatment.

4.1 MANAGEMENT OF AVULSIONS

Appropriateness of Treatment: An avulsed tooth is totally displaced from its bony socket. Recent avulsion requires acute care; avulsions with long extra-alveolar time may be replanted with expectation of ankylosis.

Procedures: Treatment, whether a developing or fully formed tooth, is directed toward timely replantation of the avulsed tooth. Definitive care for mature teeth and developing teeth, in which revascularization does not take place, consists of root canal therapy. The following pertains to teeth with ***less than one hour of extra-alveolar (dry time) time, or teeth transported in an acceptable transport medium:***

4.1.1 Rinse the tooth without touching the root surface, irrigate the tooth socket and gently replace the tooth into its normal position. Stabilize by splinting to adjacent teeth using a non-rigid type of splint; stabilize for a minimum of one week and possible one or two more weeks to allow re-attachment of periodontal ligament fibers. Systemic antibiotics should be prescribed for five days (penicillin or doxycycline); if tetanus booster is less than five years, a new booster injection is appropriate.

4.1.2 For developing teeth with wide open apexes, pulpal revascularization may be expected and definitive care consists of monitoring (3 to 6 week intervals) for evidence of pulpal revascularization: continued root formation.

4.1.3 For fully formed teeth, root canal therapy is appropriate and indicated. The optimal time for root canal therapy is within 7-10 days following replantation. In developing teeth in which revascularization does not take place, apexification procedures followed by root canal treatment, should be initiated as soon as lack of revascularization has been established. Interim treatment with calcium hydroxide is indicated if signs of root resorption are present.

For teeth with more than one hour of extra-alveolar dry time, replantation will likely result in ankylosis. In children, it is important to monitor the tooth for ankylosis and perform ***decoronation*** when the crown is more than 1mm in infra-occlusion when compared to adjacent non-injured teeth.

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