

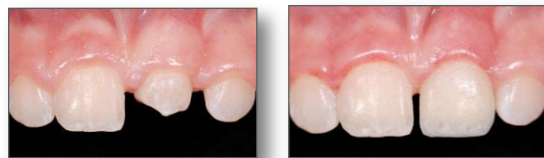
LONG TERM RESTORATIVE OPTIONS FOR THE GROWING PATIENT

If the tooth is lost during the trauma, or begins to degenerate after re-implantation or even after endodontic treatment, the next course of action is particularly critical in patients who are still growing and cannot benefit from the use of dental implants immediately. Treatment options are dependent on the age of the patient and the amount and location of the destruction of the tooth.

Some treatment options are aimed at maintaining ridge dimension and soft tissue esthetics long term while waiting for cessation of growth. One option is decoronation and maintenance of the retained root for as long as possible. The root may resorb, but bone should replace it. Socket grafting with bone and ridge augmentation with soft tissue is an option if the tooth is lost at the time of trauma.

Orthodontics can definitely play a role if the occlusion and jaw relation will allow for space closure. Teeth can also be moved into adjacent spaces to develop a ridge if it is severely deficient.

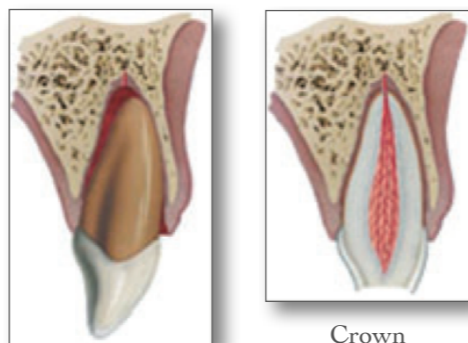
One of the less obvious long term options is auto transplantation. This is limited to patients with a developing mandibular premolar that has an immature root that is transplanted into the site of the missing tooth (below), then restored to match the contralateral tooth.



Taken from: KinzerSpear.com

TYPES OF TRAUMA

Dental trauma can range in severity from a simple chip of the enamel, to complete avulsion of a tooth from the mouth with combined alveolar or jaw fracture. Traumatic dental injuries comprise 5% of all injuries for which people seek treatment. One review of the literature indicates 25% of all school children experience dental trauma (most commonly luxation/dislocation), with rates at 33% for adults primarily before age 19, and usually in the form of a crown fracture.



Luxation

Crown Fracture

Taken from: Dental Traumatology 2012

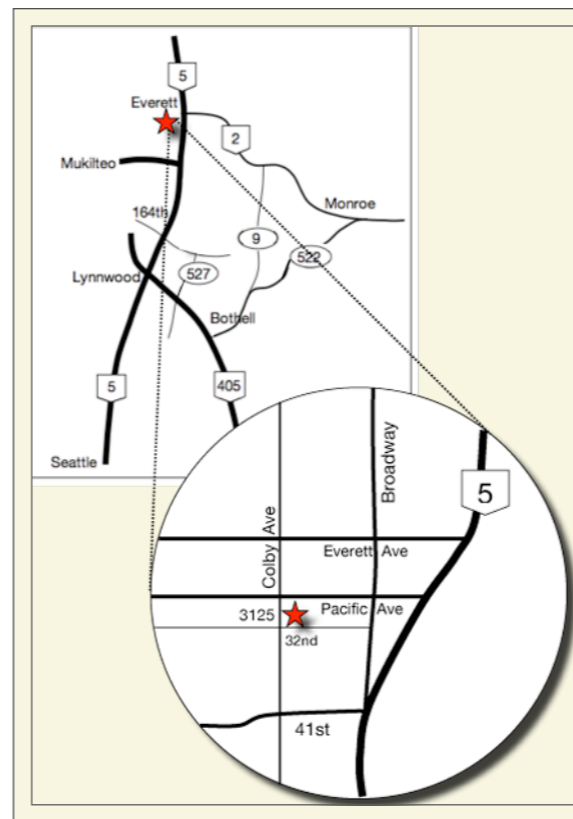
Avulsion is a complete loss of a tooth from the mouth. It occurs in 0.5-3% of all dental trauma, and is the most serious of the types of dental injuries. In these situations, the action taken immediately after trauma is most critical to determining the long term prognosis of the involved tooth or teeth.

This issue of **ProbeTips** which will review the most current literature for managing dental trauma. Because there are many factors which can dictate the treatment you perform, decision trees are helpful. An excellent online resource to consider is: www.dentaltraumaguide.org

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Pamela A Nicoara DDS MSD PLLC

PERIODONTOLOGY IMPLANTOLOGY ORAL MEDICINE



3125 Colby Avenue, Suite H
Everett WA 98201
T: 425-374-5380 F: 425-374-5382

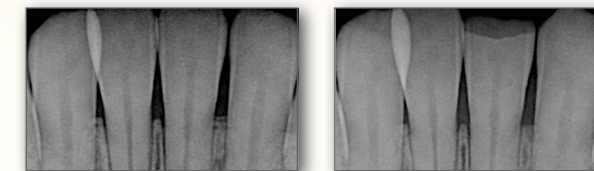
www.NICOARAPERIO.com
doctor@NICOARAPERIO.com

PROBE TIPS

A QUARTERLY PERIODONTAL
NEWSLETTER

BY PAMELA NICOARA DDS MSD

Dental Trauma Tooth Fracture, Luxation and Avulsion



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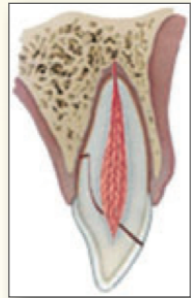
Treatment of Dental Trauma

TOOTH FRACTURE

Most tooth fractures are readily restored with composite using glass ionomer (or calcium hydroxide covered by glass ionomer with regard to involvement with the pulp) as a base. In young patients with immature teeth, consider pulp capping or partial pulpotomy if fracture definitively involves the pulp. Follow up for symptoms or infection are necessary in case root canal treatment is indicated.

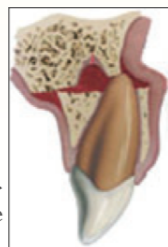
If crown fracture involves a portion of the root as well, a decision must be made regarding the depth of the fracture and restorability.

Fractures of the root that are more than 2mm below the osseous crest are difficult to manage without clinical crown lengthening or orthodontic extrusion. Clinical crown lengthening in the anterior is not always the treatment of choice when gingival margins will become significantly uneven, particularly if the patient has a high smile line. Orthodontic extrusion requires a root that is long enough to be extruded and still maintain osseous support, and will often require clinical crown lengthening to bring the gingival margins back to a uniform level post orthodontic treatment. If the fracture is too deep, extraction may be necessary.



ROOT AND ALVEOLAR FRACTURE OR TOOTH LUXATION

For any situation, the tooth and bone should be repositioned and teeth stabilized with a non-rigid splint for at least 4 weeks. The only exception is intrusive luxations of 3mm or less (see next panel), which should be allowed to



Alveolar Fracture

re-erupt for 2-4 weeks. If the tooth does not erupt on its own after that time, then orthodontic treatment should be initiated, as well as endodontic therapy as needed. Deep luxations require immediate orthodontic extrusion.

For root fractures, the more coronal the root fracture, the longer the stabilization period (up to 4 months), and the worse the long term prognosis. Monitor for pulpal necrosis and perform root canal therapy of the coronal segment as necessary.



Intrusive Luxation

TOOTH AVULSION IMMEDIATE CARE

Avulsion of a permanent tooth is considered by some to be one of the few true dental emergencies. Immediate re-implantation is the treatment of choice for permanent teeth (primary teeth should not be re-implanted). Re-implantation as quickly as possible is aimed at reducing damage to the PDL (which in turn relates to the risk of ankylosis) and potentially allowing revascularization of the pulp in immature teeth.

If not in the dental office, patients should be instructed to handle the tooth by the crown only, and care should be taken to avoid touching the root and PDL. If the tooth is dirty, patients should be instructed to rinse it for a maximum of 10 seconds under cold running water, then hold the tooth in place for at least 5 minutes with biting pressure on a napkin or other material if gauze is not available.

However, if immediate re-implantation is not possible, several forms of transport media are recommended such as milk or Hank's Balanced Salt Solution. If the patient is old enough not to swallow the tooth, it can be placed in the cheek, or the patient can spit into a cup and the tooth placed in the saliva. The tooth should not be stored in water.

CONTINUED CARE

Treatment of the re-implanted tooth is dependent on the maturity of the tooth root (open or closed apex) as well as how long the tooth was dry out of the mouth as this influences the viability of the PDL cells.

If the tooth has been re-implanted when the patient arrives in the dental office, the area should be cleaned with water spray or chlorhexidine rinse, and any lacerations sutured. A flexible splint should be applied for the first two weeks (rigid splints can promote ankylosis), and an antibiotic administered. Cleaning the area by the patient should be performed with chlorhexidine or a soft toothbrush for the first week. The patient should consume a soft diet for the first two weeks and resume normal function thereafter. The patient should be referred to their physician if tetanus coverage is uncertain, particularly if the tooth has been in contact with soil. And finally, appropriate action should be taken if physical abuse is suspected.

For teeth with a closed apex, root canal treatment should be initiated in 7-10 days post re-implantation. Calcium hydroxide should be used for one month, then root canal filling can be performed.

For teeth with an open apex, although pulp necrosis is certain for tooth avulsion, root canal treatment is only performed if infection develops and/or the pulp space does not revascularize on its own.

If it has been less than 60 minutes of extra-oral dry time and you will be re-implanting the tooth, make sure to gently but thoroughly rinse the root and apex and socket with saline. In immature teeth, the root surface can be treated with a topical antibiotic (1mg / 20mL saline soak for 5 minutes) which appears experimentally to improve the chance of revascularization. The same splinting and endodontic guidelines listed above are recommended.

If it has been more than 60 minutes, the prognosis

for any tooth is poor, and ankylosis and root resorption is expected. Re-implantation is still suggested to maintain alveolar bone, particularly in a growing patient. A soak for 5 minutes in fluoride may slow the rate of ankylosis. Endodontic treatment may be more easily performed out of the mouth. Splinting in this case is for four weeks rather than two.

It is recommended that these patients should be re-evaluated at 3 months, 6 months, 1 year and yearly thereafter in order to monitor for negative changes such as root resorption or apical infection.

The long term expectation is that in up to 70% of cases, root resorption will occur. In the case below, tooth #8 was avulsed and dry out of the mouth for 20 minutes before it was re-implanted in this 24 year old male. Root canal therapy was initiated about 2 weeks later, and orthodontic treatment was performed to better align the teeth as #8 was more coronal than #9 and to correct the diastema. Ankylosis developed during the course of orthodontic treatment, and the tooth is being monitored for eventual implant replacement when root resorption overcomes the tooth.



Endo post Re-implantation 2012

REFERENCES

- Dental Traumatology* Andersson et al. 2012.
- Dental Traumatology* DiAngelis et al. 2012.
- Pediatric Dentistry*. McIntyre et al. 2009.

complete references available on request