

Endodontic Spotlight

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Introduction

With the warmer weather and more people being active outside, it seems like it would be a good time to talk about dental trauma. In our third edition, we look at a couple of trauma articles, including my own publication. In addition, we have a very interesting article that looks at the success of various supplemental anesthesia techniques following an inferior alveolar nerve block in a hot lower molar.

Spotlight on Traumatic Dental Injuries

The management of dental trauma is a significant clinical challenge that dentists must be prepared to address. The most frequent causes of dental trauma are falls, accidents, sporting injuries and physical assaults, and maxillary central incisors are the most commonly injured tooth. The prevalence of dental trauma in children has been estimated to be around 30%.

Numerous types of injuries are possible to both hard and soft tissues. Tooth related hard tissue injuries include uncomplicated and complicated crown fractures, crown-root fractures, root fractures, and alveolar fractures. Injuries to the periodontium include concussion, subluxation, extrusive, lateral, and intrusive luxations, and avulsions. Additionally, the patient can have injuries in the soft tissue as well as the maxilla or mandible bones.

Treatment varies dramatically based on the specific diagnosis. In more complicated cases, the tooth may need to be repositioned, stabilized with a flexible splint, and have root canal therapy, and the patient should be given antibiotics and a tetanus booster. Timely management is also very important, as delaying care can result in significant resorption and compromise the prognosis of the tooth. Long term follow up is necessary as the prognosis is often uncertain.

The American Association of Endodontists has published their guidelines for the treatment of most traumatic dental injuries. I have found this to be the best organized and most concise reference available. It is available online at: http://www.aae.org/uploadedFiles/Publications_and_Research/Guidelines_and_Position_Statements/2004TraumaGuidelines.pdf.

Blomlof L, Lindskog S, Andersson L, Hedstrom KG, Hammarstrom L. Storage of Experimentally Avulsed Teeth in Milk Prior to Replantation. J Dent Res 1983;62:912-6.

This classic study demonstrated that milk is a good short term storage medium for avulsed teeth. Monkey incisors were extracted, endodontically treated, and then replanted after a few hours of extraoral time. The teeth were stored in either milk or saliva for two or six hours. Control teeth were either dried for one hour or replanted immediately. After eight weeks the animals were sacrificed and the teeth were analyzed histologically. They found that teeth stored in milk for two or six hours or in saliva for two hours had healing similar to the immediately replanted teeth. In contrast, teeth that were dried or left in saliva for six hours had significant replacement resorption. *SUMMARY: While replanting the tooth immediately is recommended, if the patient or parent is unable or unwilling to replant the tooth, milk may be suitable storage medium for up to six hours.*

Kwan SC, Johnson JD, Cohenca N. The Effect of Splint Material and Thickness of Tooth Mobility After Extraction and Replantation Using a Human Cadaveric Model. Dent Traumatol 2012;28:277-81.

In this publication of my Master's thesis, we looked at the effect of different splints on tooth mobility after extraction and replantation in a cadaveric model. Although the current guidelines for the management of traumatic dental injuries recommend the use of a "flexible" splint, the precise definition of what is considered flexible versus rigid has not been rigorously defined, thus leaving the clinician with a wide range of options. We tested the mobility of an extracted and replanted tooth after it was splinted with eight different splints. The splints included six wire-composite splints made with stainless steel or nickel titanium wire of 0.012", 0.016", or 0.020" diameter, a fishing line-composite splint with 30 pound-test monofilament nylon fishing line, and a direct composite splint where a rope of composite was bonded across the facial surfaces. There was no significant difference among the fishing line-composite splint and the wire-composite splints. However, direct composite splint was significantly more rigid than the fishing line or lightweight wire-composite splints. *SUMMARY: Fishing line or wire composite splints up to 0.016" diameter are significantly more flexible than direct composite splints and thus may be better suited for the splinting and management of traumatized teeth.*

Kanaa MD, Whitworth JM, Meechan JG. A Prospective Randomized Trial of Different Supplementary Local Anesthetic Techniques After Failure of Inferior Alveolar Nerve Block in Patients with Irreversible Pulpitis in Mandibular Teeth. J Endod 2012;38:421-5.

This randomized controlled trial looked at four different supplemental anesthetic techniques used when an inferior alveolar nerve block (IANB) was unsuccessful. 182 patients with irreversible pulpitis in a mandibular tooth were anesthetized with an IANB with 2.0 mL of 2% lidocaine with epinephrine. If the patient experienced pain during treatment, one supplement anesthetic was given. The techniques were a repeated IANB (2.0 mL of 2% lidocaine with epinephrine), buccal infiltration with 2.0 mL of 4% articaine with epinephrine, an intraligamentary (PDL) injection (0.18 mL of 2% lidocaine with epinephrine), or an intraosseous injection (1.0 mL of 2% lidocaine with epinephrine). Of the 182 patients in the study, just 82 had pain free treatment with only the first IANB, while 60 continued to have a positive response to pulp testing and 40 had pain during treatment despite a negative pulp testing response. These latter 100 patients received one of the four additional anesthetic techniques. Following supplemental anesthesia, pain free treatment was obtained in 84% of patients receiving articaine buccal infiltration, 68% with intraosseous anesthesia, 48% with intraligamentary, and 32% with a repeated IANB. Anesthesia using buccal infiltration of articaine or intraosseous was significantly more successful than the other techniques, but were not significantly different from each other. The authors also found similar results when just mandibular molars were analyzed and when treatment involved only pulp extirpation (versus pulp extirpation and extraction). *SUMMARY: In a randomized controlled trial, the authors found that IANB alone is often not adequate for pain free treatment of mandibular teeth with irreversible pulpitis, and that supplementary anesthesia using a buccal infiltration of articaine or intraosseous was the most effective way to obtain adequate anesthesia.*

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