

Endodontic Spotlight

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Spring 2012



Introduction

Welcome to our second edition of Endodontic Spotlight. Thank you for all the nice feedback on the first one. In this issue we take a little deeper look at cracks and vertical root fractures, as well as pain management and endodontic outcomes.

Krell KV, Rivera EM. A Six Year Evaluation of Cracked Teeth Diagnosed with Reversible Pulpitis: Treatment and Prognosis. J Endod 2007;33:1405-7.

This is a very useful clinical outcome study looking at cracked teeth with reversible pulpitis. Teeth were diagnosed as cracked by using transillumination. Teeth with reversible pulpitis did not have spontaneous pain, had a nonlingering cold response, and no apical pathology. The 127 teeth that were diagnosed as both being cracked and having reversible pulpitis were crowned and followed over the next six years. Over the next six months, just 27 of 127 teeth progressed to irreversible pulpitis or pulp necrosis requiring root canal therapy; the other teeth did not need root canal therapy for the duration of the study (6 years). *SUMMARY: If a tooth with a crack has reversible pulpitis is crowned, it has just a 20% chance of needing root canal therapy.*

Spotlight on Cracks versus Vertical Root Fractures

Cracked teeth and vertical root fractures are a commonly confused terms. Although both have a break in tooth structure, they have different characteristics, etiologies, treatments, and prognoses.

Cracked teeth are characterized by a crack extending from the occlusal surface in an apical direction. Typically these are usually located on the mesial or distal of the tooth and are most often found in mandibular molars followed by maxillary premolars. Symptoms range from asymptomatic to irreversible pulpitis with severe biting pain depending on the extent of the crack. Key diagnostic techniques used to identify cracked teeth include probing, Tooth Slooth, and transillumination. Cracks are usually caused by excessive occlusal forces. Full coverage is critical to try to save the tooth and may involve root canal therapy depending on the extent of the crack. Sometimes, if the crack is too extensive and can be visualized running across the pulpal floor or down a canal using an endodontic microscope, the tooth should be extracted.

Vertical root fractures occur when the crack extends from the apex in a coronal direction. Typically they are present in on the buccal or lingual surface of teeth that have had previous root canal therapy. They are often asymptomatic until the fracture results in an associated periodontal defect. They can be difficult to diagnose and no single pathognomonic feature exists, though certain clinical and radiographic signs can be suggestive of a fracture. These signs include precipitous periodontal pockets, multiple sinus tracts, loosened posts, loosened retrofillings, radiolucent or radioopaque lines along the length of the root, or “halo” or “periodontal” type radiolucencies. However, a definitive diagnosis can only be made through direct visualization through surgical exposure or extraction. The most common causes are excessive lateral condensation forces, dowels or posts, and inlays. Teeth with vertical root fractures should typically be extracted, though removing the fractured root through a root amputation or hemisection is possible.

Wells LK, Drum M, Nusstein J, Reader A, Beck M. Efficacy of Ibuprofen and Ibuprofen/Acetaminophen on Postoperative Pain in Symptomatic Patients with a Pulpal Diagnosis of Necrosis. J Endod 2011;37:1608-12.

The authors compared effectiveness of 600 mg ibuprofen versus a combination of 600 mg ibuprofen plus 1000 mg acetaminophen to manage postoperative pain in a prospective double blinded randomized controlled trial. The patients had moderate to severe pain due to a tooth with a necrotic pulp with a periapical radiolucency. Although pain decreased over time for both groups, surprisingly no significant differences were seen between the two groups. There was no difference in the pain level, the amount of medication used, or the use of the additional escape medication (Vicodin). This study is in contrast to others that showed that a single dose of 600 mg ibuprofen with 1000 mg acetaminophen was more effective than ibuprofen alone.

SUMMARY: According to this study, there is no increase in effectiveness between 600 mg ibuprofen with 1000 mg acetaminophen compared with ibuprofen alone; however, other previously published studies have shown more effective pain management with a combination of ibuprofen and acetaminophen compared with ibuprofen alone.

Salehrabi R, Rotstein I. Endodontic Treatment Outcomes in a Large Patient Population in the USA: An Epidemiological Study. J Endod 2004;30:846-50.

This is one of the largest outcome studies in endodontics. The authors measured the 8 year survival rate of 1,462,936 teeth receiving root canal therapy using the Delta Dental insurance database. They found a survival rate of 97.1% and that, of the teeth that failed, 85% lacked full coronal coverage. These findings suggest that root canal therapy has a very high survival rate and that full coverage improves the likelihood of survival. This study provides strong evidence that justifies the need for a crown on a root canal treated tooth. *SUMMARY: In an insurance database study of 1.5 million teeth, 97.1% of the teeth survived at 8 years, and that, of the teeth that failed, 85% lacked coronal coverage.*

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