

# Endodontic Spotlight

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## Introduction

I hope everyone has been enjoying this beautiful summer and are finding a way to stay cool in the heat! In this issue we are going to continue to highlight important topics we have covered in the past by focusing on cracks and vertical root fractures. We start by comparing and contrasting these two situations and then have an interesting article that looks at treatment planning considerations for cracked teeth with reversible pulpitis.

## 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 or mid-root 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.

## **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 has a crack and reversible pulpitis is crowned, it has just a 20% chance of needing root canal therapy in the next six years.*

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