

Diagnosing and Treating Cracked Teeth

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Cracked teeth present with a variety of symptoms which can often make the diagnosis difficult. Patients can present with erratic pain when chewing, pain upon biting down, pain upon releasing, and/or sensitivity to temperature changes. In many cases, the pain is not consistent in nature, but rather comes and goes, and varies in nature from a slight sensitivity to biting to a very severe spontaneous pain consistent with irreversible pulpitis. Our inability to visualize the extent of the crack through clinical exam alone is one aspect that leads to the complexity of accurately determining an endodontic diagnosis. Another confounding aspect is that there is no direct relationship between a clinically visible crack and a patient's symptoms or need for endodontic treatment.

The location, direction, and extent of the crack have a profound effect on the prognosis of the tooth and the choice of treatment. Longitudinal tooth fractures can be characterized into the following five basic types:

- Craze Lines
- Fractured Cusp
- Cracked Tooth
- Split Tooth
- Vertical Root Fracture

Craze lines only affect the enamel, while fractured cusps, cracked teeth and split teeth begin on the occlusal surface and extend apically, affecting enamel, dentin and possibly, the pulp. Vertical root fractures on the other hand begin in the root and extend coronally. Once any fracture has extended to and affected the pulp, severe pulpal and/or periapical pathosis is likely to follow.

Craze Lines

Most adult teeth have craze lines. They are more common in anterior teeth than posterior teeth and because they only affect the enamel are asymptomatic. Craze lines can be differentiated from cracked teeth by transillumination with a pin-point light source, such as a fiber optic light. If the tooth is cracked, the light will not transmit through the tooth structure, allowing



only a segment of the tooth to light up. If the tooth only has craze lines, the entire tooth will light up. No endodontic treatment is necessary for craze lines.

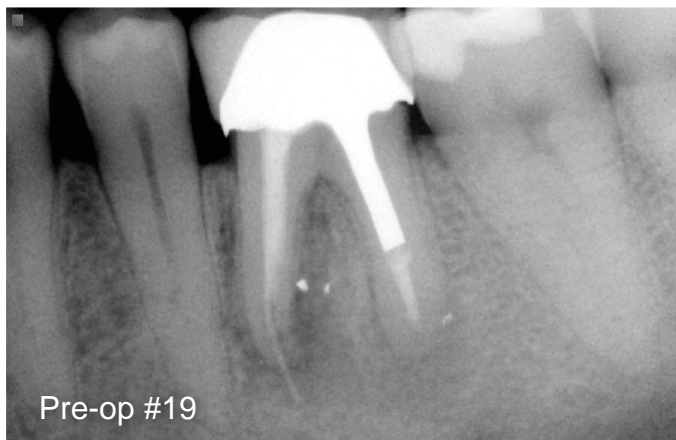
Fractured Cusp

A complete or incomplete fracture initiating from the crown of the tooth and extending gingivally, usually both mesiodistally and buccolingually is termed a fractured cusp. The fracture usually involves at least two aspects of the cusp by crossing a marginal ridge and also extending down a buccal or lingual groove. Endodontic treatment is necessary in the event that the crack affects the pulp or results in irreversible pulpitis.

Cracked Tooth

An incomplete fracture initiating from the crown and extending subgingivally is termed a cracked tooth.

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The fracture may extend through either or both of the marginal ridges, and is usually more centered than an incomplete fractured cusp. Pulpal and periapical pathosis is more likely to be present as the crack extends apically. A cracked tooth can be distinguished from a split tooth by using wedging to test for mobility. No mobility suggests a cracked tooth, while mobility of the affected segments indicates a split tooth. Initiation of endodontic treatment for a cracked tooth is dependent on the pulpal and periapical diagnosis. A tooth with a minimal crack requires endodontic treatment only if the diagnosis indicates a need for it. In cases of cracked teeth, the patient should be fully informed that the prognosis is questionable, especially since the fracture has the potential to extend further apically over time. The long-term prognosis for a cracked tooth is better when the crack does not extend beyond the pulpal floor and the tooth is rendered pain free by the placement of a temporary crown. Bonded core build-ups should be used and posts should be avoided in a cracked tooth. The prognosis of a cracked tooth is more variable than with other types of longitudinal fractures.

In general, a cracked tooth with a fracture that extends apically beyond the pulp chamber floor, exhibits a deep isolated probing depth corresponding to the location of the fracture, presents with a sinus tract, or remains symptomatic after endodontic treatment and cuspal coverage with a temporary crown has a poor prognosis. In these cases, extraction should be considered.

Split Tooth

A complete fracture initiating from the crown and extending subgingivally through both marginal ridges is termed a split tooth. A split tooth is the end result of a cracked tooth. The tooth segments are now entirely separate and clinically mobile. Split teeth have a hopeless prognosis and should be extracted.

Vertical Root Fracture

A complete or incomplete fracture initiating from the apical portion of the root and extending coronally is termed a vertical root fracture. The fracture may extend the length of the root or occur as a shorter crack at any level along the root surface. Patients with vertical root fractures typically present with minimal signs and symptoms until periapical pathosis occurs. Radiographic diagnosis of a vertical root fracture can be difficult as the appearance often mimics periodontal disease or failed root canal treatment. Deep isolated probing depths, "J-shaped" radiolucencies extending around the apex and coronally along one or both sides of the root, and persistent sinus tracts are pathognomonic signs of vertical root fractures. The only predictable treatment is removal of the fractured root or extraction of the tooth.

Further Reading

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