

TRANSILLUMINATION: THE “LIGHT DETECTOR”

Use the “Light Detector” like a lie detector to truly determine if a crack is there or not.

Diagnosis Versus Detection

Identification of cracked teeth may occur by visual inspection with the unaided eye, although many times diagnostic tests must be used to detect the crack. Removal of restorations and revisualization may be necessary, although most cracks occur in teeth with no or minimal restorations.

Patient responses, particularly to biting, may also be helpful, but many patients with cracked teeth are asymptomatic. Diagnostic tests to detect cracks include transillumination, staining, biting forces, periodontal probing (resulting in narrow isolated pocket depths), wedging (resulting in no separation of tooth segments) and magnification.

Cracks that are present in teeth are findings; they are not to be considered a pulpal or periapical diagnosis. The treatment is variable, as well as the prognosis. An important consideration is the lack of published research related to the prognosis of cracked teeth. Further research is needed to support prognosis and treatment decisions heretofore based upon only clinical experience and perceptions.

The detection of a cracked tooth is often difficult. As already stated, normal diagnostic tests that are useful in other situations, such as sensitivity testing and radiographic evaluation, may not be as helpful for detecting a tooth with a crack. This is because the crack with its potential to harbor bacteria and bacterial byproducts may have not completely extended to the pulp. The pulpal diagnosis for a tooth with a crack could be normal, reversible pulpitis, irreversible pulpitis or necrosis. This can be very confusing from the clinical and research perspectives.

The Use of Transillumination to Detect Cracks in Teeth

Transillumination is the detection method that provides the most information, and easily and graphically represents whether a crack is present. It is based on a law of physics, namely that a beam of light will continue to penetrate through a substance until it meets a space, after which the light beam is reflected. This results in a light and a dark area of the tooth separated by the fracture line.

Sources of light other than from the transilluminator (i.e., overhead lighting and operator lighting) should not be used. A dental mirror must be used to evaluate whether a fracture is present. A dental (surgical) operating microscope is useful, particularly by turning off the light source and using only magnification along with the dental mirror and transilluminator.

Various transilluminators are commercially available, but you could use a fiberoptic handpiece with the bur removed (do not forget to turn the water off), composite curing lights (protect your eyes if using ultraviolet light) and other tools as transilluminators.

Transillumination of teeth to detect the presence of cracks should be performed in all of the following instances:

- On the marginal ridges,
- Floor of the cavity preparation
- The pulpal floor after endodontic access preparation
- Accessible proximal surfaces
- During surgical flap reflection procedures

Transillumination is particularly beneficial when performed after restorations are removed. Many fractures are not visualized without transillumination. The more transillumination is performed, the more fractures will be identified.