



Venetian Pointe Dentistry

A Newsletter Prepared by Richard C. Rampi, DMD

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The Cracked Tooth !!! An “Incomplete Tooth Fracture (ITF)”

The patient’s teeth have been cleaned by the hygienist and it’s time for the examination. During the exam, the following dialogue ensues:

Dr. Rampi: *How has your mouth been feeling? Do you have any concerns to report?*

Ms. “Smith”: *I suppose ... I haven’t been able to chew on the left side of my mouth for the past few weeks. I find I do all of my chewing on my right side. It doesn’t hurt all the time ... but, when it hurts “I see stars”! This area has also been more sensitive to cold than before. For the most part, it doesn’t bother me as long as I don’t bother it! I just don’t know what’s going on!*

Dr. Rampi: *Are you able to localize the pain to a specific tooth?*

Ms. “Smith”: *No ... I can’t even tell if it’s an upper or a lower tooth. I know it’s one of my back ones but I can’t really tell which one it is!*

Dr. Rampi: *All right ... let’s take a look ...*

Does this sound familiar? It likely does for many of you since the culprit for the pain in a scenario such as this is often a “cracked tooth”. A cracked tooth happens to be the third most common reason for tooth loss^{5,12}. The subject of this article pertains to “the cracked tooth”. In a newsletter I wrote in 2006, I wrote about “Cracked Tooth Syndrome”. Because of the prevalence of this unfortunate malady, I believe I’ve dispensed the 2006 newsletter more than all of the others I’ve written over a span of nearly 30 years combined.

In this year’s newsletter, I will rephrase the information in a manner typical of the way I disseminate it when consulting with a patient regarding this condition. The focus of the newsletter will be restricted to a crack that includes the

natural crown of the tooth; fractures confined to the root of the tooth will not be considered in this paper. References for this newsletter are provided on Page 3.

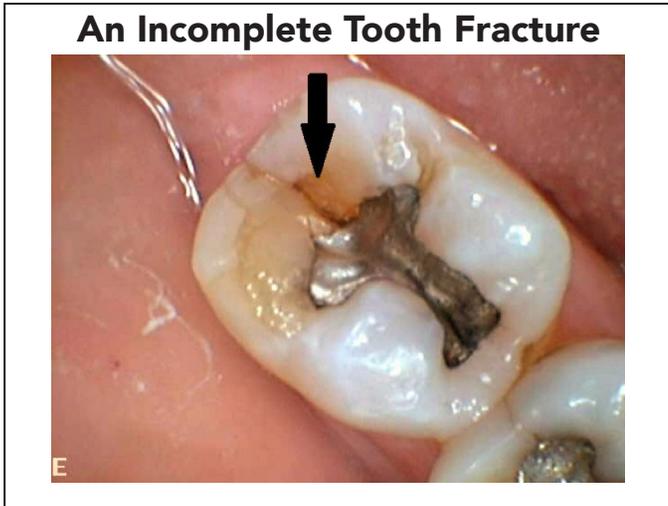
What is a cracked tooth? A cracked tooth is a tooth containing a fracture plane that extends through the enamel of the crown of the tooth and into the dentin. Depending upon the severity, the crack typically results in pain when chewing but can also result in pain to cold, heat, sweets, lingering pain, radiating pain, or pain that’s spontaneous. The pain can range from relatively mild and can be reasonably tolerated by the patient (as depicted in the fictional dialogue found in the opening of this paper), to severe pain that results in the immediate need for root canal treatment or the extraction of the tooth.^{2,3,8,11}

A “cracked tooth” is different than a “fractured tooth”. In the former case (a crack), the tooth usually will appear to be intact whereas in the latter case (a fracture) a piece of the tooth breaks away leaving an open cavity that’s obvious to the patient. Since the fractured portion of the tooth doesn’t completely break away from the tooth, a crack is technically referred to as “an incomplete tooth fracture” (which is abbreviated as “ITF”).

ALSO IN THIS NEWSLETTER:

“This and That” from the Office
From the Doctor’s Desk

The photo below is one taken before the treatment of one of my patients with an incomplete tooth fracture. Note how the ITF extends deep into the tooth.



By definition, the fracture plane is of “unknown depth and direction”. The full definition is provided in the footer of this page (see below). The actual crack almost never shows on an x-ray. At the same time, many teeth visually look cracked when they’re not. For these reasons, diagnosing a cracked tooth can be elusive.

In addition to sometimes being difficult to diagnose, an ITF can be especially difficult to prognosticate. In other words, it’s not possible to say with 100% confidence what treatment is needed to eliminate the pain resulting from a cracked tooth. Sometimes a crown will resolve the condition whereas, in the case of a severe crack, even with proper root canal treatment and a well-fit crown the tooth can still be lost. This is in sharp contrast with a complete tooth fracture in which case the full extent of injury is known; in this case, the treatment needed and the chance for success is more clear.^{1,7,8,9}

A cracked tooth is not like a broken bone. Typically speaking, when a bone fractures it will heal with proper treatment. For example, when someone fractures a bone in their arm, the doctor will reset the fractured bone(s), place a cast, and, in due time, the bone mends itself. Once the bone has healed, the cast is removed and everything is back to normal. In contrast, once a tooth is cracked it’s always cracked. The minimum treatment for a cracked tooth is a full crown that completely surrounds the circumference of the tooth.⁴ In essence, the crown acts in the same fashion as the cast as used in the analogy of a broken bone (it fixates the two portions where the plane of fracture has occurred). The difference is the crown is not ever removed since the cracked tooth is not capable of mending itself.

As noted previously, the treatment needed to eliminate the pain associated with an incomplete tooth fracture cannot be determined with 100% confidence (again, by definition, the fracture plane is of “unknown depth and direction”). The treatment recommended is based upon an interpretation of the symptoms conveyed by the patient and the signs discovered as result of the exam performed by the dentist. The “hallmark sign” of a cracked tooth is pain to pressure. Pain to pressure can usually (but not always) be reproduced in the office with tests gauging whether or not there’s pain. When a tooth is found to have the classic signs consistent with an ITF, this is referred to as “Cracked Tooth Syndrome”.^{2,3,8,10}

When there’s consistent pain only to pressure that is reproduced clinically and the nerve of the tooth is proven to be healthy otherwise, then a crown is the minimum treatment of choice. However, when there’s severe pain triggered by temperature that radiates to other locations of the mouth and/or lingers for long periods of time, then root canal treatment is often required. In some cases, the ITF is so deep the prognosis for the tooth proves to be hopeless. In this case, no matter what treatment is provided the ultimate treatment required is the extraction of the tooth. Since prognosticating a cracked tooth is elusive, sometimes a tooth is found to have a hopeless prognosis only after treatment has been performed properly and, despite best efforts, the treatment proves to be unsuccessful.^{2,3,8,10}

A crack in a tooth usually results when a back tooth restored with a relatively small “silver” filling is subjected to extreme force. Often this is the result of a masticatory accident (when unexpectedly biting on a hard object such as a foreign body in food). The patient is usually between the ages of 30 and 50. For patients younger than 30 the teeth are resilient enough to survive the excessive force and older than 50 most teeth that are prone to crack will have cracked by then. Molars chew food in a fashion similar to “a mortar and pestle” (like the bowl and crusher seen used by a pharmacist). Therefore, a lower molar cracks most frequently (the lower tooth acts like the “mortar” while the large cusp of the upper molar acts like the “pestle”). Another reason why back teeth crack most frequently is because we are mechanically able to exert more force on our back teeth because these are closer to the point where the hinge for chewing is located (the TMJ or jaw joint ... a “lever effect” similar to a nutcracker). Females and males crack teeth with equal frequency.^{1,6,8,11,12}

If you have the misfortune of cracking a tooth, I hope you find the information contained within this newsletter to be helpful.

The definition of an incomplete tooth fracture: “a fracture plane of unknown depth and direction passing through tooth structure that, if not already involving, may progress to communicate with the pulp and/or periodontal ligament”. (Ellis, S.G. “Incomplete tooth fracture – proposal for a new definition.” British Dental Journal, p424-428, April 2001.