

Survival of Endodontically Treated Cracked Posterior Permanent Teeth

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INTRODUCTION

Dr. Mary Dabuleanu discusses the management of cracked teeth in endodontic practice, referencing the recent review article *Outcome and Survival of Endodontically Treated Cracked Posterior Permanent Teeth: A Systematic review and Meta-analysis*, published in the Journal of Endodontistry, April 2020.

The study looked at pre-operative factors and the survival/success of teeth with cracks that required root canal treatment. It consisted of a meta-analysis of 7 studies with at least a one year follow up.

KEY FINDINGS OF STUDY

- Remarkably high survival and success rates for cracked teeth were documented that were on a par with regular teeth requiring root canal treatment
 - **Survival – 85%**
Note: survival was defined as the tooth being in the mouth at the one year follow-up and was not planned for extraction.
 - **Success - 88%**
Note: success was defined as complete periapical healing, radiographic healing, clinically asymptomatic and good periodontal support.
- Having a periodontal structure affected by a crack was a significant factor in success. Pre-existing periodontal pockets around the teeth decreased success rate by as much as 11%.

PERIODONTAL POCKETS

- It is important to look out for periodontic conditions associated with cracks.

- When assessing the periodontal support around a tooth requiring root canal treatment, it is important to decide whether the crack is causing the pocket or whether a necrotic tooth with chronic apical abscess is draining through the periodontal support and mimicking a crack.
- Periodontal implications depend not only on the size of the crack but on where the crack is located. A small crack in the wrong spot can cause the periodontal supporting structure to be affected.
- As a crack extends and travels beyond the CEJ onto the pulpal floor and into canal, it starts to affect the root structure. As it extends to the outer surface of the tooth it starts to attract microorganisms, periodontal breakdown, and the pocket deepens.
- If you give any crack enough time, there is going to be a loss of periodontal support along the crack line, usually along the buccal or lingual lines of the teeth.

TIPS ON DIAGNOSIS AND MANAGEMENT

- Correct diagnosis of cracks is paramount. Be cautious and prudent. Do not rush to judgement.
- Cracks can be difficult to see. Always use some level of magnification and try to look on the outer side of the root surface where a crack has been identified to see a crack line (possibly using staining or illumination).
- When dealing with pulpitis, patients frequently cannot localize the pain. Instead of only focussing on the most likely tooth – for example a tooth with the large filling - take every tooth in line in that quadrant and the quadrant above and make a full assessment of the pulpal and periapical status of all teeth.
- Patient history may reveal an episode of biting on something hard, followed by pain on chewing, indicating source of crack.
- Assess tooth from periodontal standpoint – establish whether there are any deep pockets.
- If a cracked tooth requires root canal treatment, outline to the patient that the prognosis – with or without periodontal support being affected – is guarded. Do not paint a rosy picture for teeth with cracks. Sometimes the long-term prognosis can be unpredictable.
- Patients need to be on board with the desire to save their own teeth.

- When a cracked tooth does not have symptoms of irreversible pulpitis, the preference is to keep the tooth alive for as long as possible. A cracked tooth without a root canal will stay in a patient's mouth a lot longer than a tooth with a root canal and a full coverage restoration. This should be the focus for dentists treating patients with cracked teeth.

RESOURCES

- [*Outcome and Survival of Endodontically Treated Cracked Posterior Permanent Teeth: A Systematic review and Meta-analysis*](#)