

Endodontic Spotlight

Steven C. Kwan, D.D.S., M.S.D.
Winter 2014



Introduction

Happy New Year! In our first issue of volume 3 we take a look at what happens after root canal therapy is completed. We start with another two articles that show the importance of getting a crown after root canal therapy is completed. Perhaps these can help convince an undecided patient just how important a crown is to the long term success of the tooth. Next we have a classic study from UW on ferrule. Finally, we spotlight the problems of microleakage reinfected the root canal system if the appropriate restorative care is not performed.

Aquilino SA, Caplan DJ. Relationship between crown placement and the survival of endodontically treated teeth. J Prosthet Dent 2002;87:256-63.

This retrospective cohort study evaluated factors that affect the survival of endodontically treated teeth. 203 endodontically treated teeth that met the study inclusion criteria were randomly selected and the records were examined for characteristics that may affect survival. Notable, 129 teeth were crowned and 74 teeth were restored with a direct definitive amalgam or composite restoration. The authors found that, when controlling for other variables, endodontically treated teeth that were not crowned were lost at a 6.0 times greater rate than endodontically treated teeth that were crowned. In addition, they also noted that second molars and teeth with preexisting decay at the time of access were lost at a greater rate. *SUMMARY: Endodontically treated teeth that are not crowned are lost at 6 times the rate of teeth that are crowned.*

Nagasiri R, Chitmongkolsuk S. Long-term survival of endodontically treated molars without crown coverage: A retrospective cohort study. J Prosthet Dent 2005;93:164-70.

This retrospective cohort study evaluated the restorative survival of endodontically treated molars that were not crowned. 220 endodontically treated molars that had not received coronal coverage were analyzed and followed for 6 months to 10.2 years. Failure was defined as the tooth requiring additional restoration, tooth repair, or extraction, though teeth lost due to endodontic or periodontic reasons were excluded from this restorative study. The restorative survival rate for decreased dramatically over time with rates of 96%, 88%, and 36%, for 1, 2, and 5 years, respectively. As expected, teeth greater amount of tooth structure remaining had a higher restorative survival rate. Restorations with direct composite survived better than those with amalgam or IRM. Overall, 6% (14/220) were deemed unrestorable and extracted during the course of the study. This is yet another study showing the importance of crowning teeth after root canal therapy. *SUMMARY: The restorative survival of endodontically treated molars that were not crowned was 96%, 88%, and 36%, for 1, 2, and 5 years, respectively.*

Libman WJ, Nicholls JI. Load fatigue of teeth restored with cast posts and cores and complete crowns. Int J Prosthodont 1995;8:155-61.

This laboratory study looked at the effect of different amounts of ferrule on the failure of crowns. 25 extracted central incisors were prepared for cast post and cores and crowns with ferrule heights of 0.5, 1.0, 1.5, or 2.0 mm. A cyclic fatigue experiment was performed using a 4.0 kg

load directed at 135 degrees from the long axis of the tooth at 72 cycles per minute. Failure was defined as the loss of seal between the crown and tooth. The authors found that teeth with 0.5 or 1.0 mm ferrule failed at a significantly lower number of cycles than teeth with 1.5 or 2.0 mm of ferrule. However, it should be noted that other studies have suggested that at least 2.0 mm of ferrule should be present. *SUMMARY: There should be at least 1.5 to 2.0 mm of ferrule to reduce the rate of cyclic fatigue.*

Spotlight on Endodontic Microleakage

If the tooth is not appropriately restored in a timely manner, bacteria from the mouth can reinfect the root canal system. Multiple research articles have shown that bacteria will rapidly penetrate the entire length of the root canal system within a few weeks to a few months, and dye studies have demonstrated leakage starting within days. This can lead to the failure of the root canal therapy and thus retreatment is usually indicated. Although one study (Ricucci, Grondahl, Bergenholtz 2000) has suggested that leakage may not be of such great clinical importance, the consensus in the endodontic community is that the coronal restoration of critical to maximizing the success of teeth with root canal therapy.

A timely definitive restoration is the best chance to stop this reinvasion of the root canal system by bacteria. Although a temporary filling can prevent this for a period of time, it is always susceptible to breaking or leaking. Thus, an intraorifice barrier can be placed over the gutta percha and chamber floor to slow down this process. These barriers are typically a colored composite, Vitrebond or glass ionomer type of material. While these will reduce the rate of leakage, they are not a substitute for an appropriate coronal restoration. Whenever we finish a root canal, we always emphasize to the patient that it is critical for them to return to their general dentist for the restoration.

Endodontic Spotlight is published quarterly by Steven C. Kwan, D.D.S., M.S.D.
Dr. Kwan practices at 6715 Fort Dent Way, Tukwila WA 98188
206-248-3330; 206-431-1158 (fax); www.seattle-endodontics.com
To subscribe or unsubscribe from this publication, email endodonticspotlight@gmail.com.
This publication may not be reproduced without written permission.
