

Endodontic Spotlight

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Introduction

This is the fourth and final issue of Endodontic Spotlight for the year. In this publication, we have an excellent study looking at the effect of apical preparation size on outcomes. I've also reviewed the technique that we teach at the UW Endodontics Department to determine apical size. On the second page there is an interesting study on anesthesia followed by an index of topics that we've covered over the year. Thanks for your continued interest in my newsletter!

Saini HR, Tewari S, Sangwan P, Duhan J, Gupta A. Effect of Different Apical Preparation Sizes on Outcome of Primary Endodontic Treatment: A Randomized Controlled Trial. J Endod 2012;38:1309-15.

This prospective randomized controlled trial is perhaps the best study ever done that looks at the effect of apical enlargement on success rates. Patients were randomly assigned to five different groups, in which the apical size was enlarged 2, 3, 4, 5, or 6 sizes larger than the first file to bind at working length. 129 patients were evaluated clinically and radiographically 12 months after root canal therapy was completed. Although all groups showed healing, the group where the apical size was only enlarged 2 sizes larger was significantly less successful than the other groups. There were no significant differences among groups where the enlargement was 3, 4, 5, or 6 sizes. Thus, instrumenting the canal 3 sizes larger than the first file to bind is adequate and additional enlargement does not provide a significant benefit. As Endo Affiliate Faculty at UW, I'm happy to point out that this technique of enlarging the apex 3 sizes above the first file to bind is exactly what has been taught by our department for decades. Perhaps when the rotary file sales reps tell us that instrumenting to a size #20 is fine, we all should remember that they did not go to dental school and take their recommendations with a grain of salt. *SUMMARY: Based on this prospective randomized controlled trial, the apical preparation size should be 3 sizes larger than the first file to bind at working length.*

Spotlight on The UW Endo Instrumentation Technique

As the Saini article (summarized above) shows, it is important to enlarge the apical portion of the canal an adequate amount to ensure that it can be fully cleaned and filled. However, in order to know how big to enlarge the canal, the first file to bind at working length must be determined. At the UW Department of Endodontics, we teach our dental students how to do this using a combination of rotary and hand files. The key to accurately determining the first file to bind is to use a crown down technique where the coronal portion of the canal is instrumented first in order to prevent the file from binding coronally instead of at the apex. In this spotlight article, I will briefly summarize this technique.

Open the chamber and achieve straight line access to the canals. Negotiate the coronal half of the canal and open of orifices using orifice opener rotary files or Gates Glidden drills. Determine the working length and create a glide path. Instrument the canal using your rotary files to two millimeters short of your working length.

Now that the coronal portion of the canal has been opened up, you can successfully determine your first file to bind. This is the smallest hand file that takes some effort to reach working length and remove it from working length. Because we know that the file is not getting stuck in the coronal portion of the canal, we can be confident that when the file binds, it is because it is contacting the dentin at the apex. This allows us to determine the size of the apical area and thus calculate how large we need to enlarge the canal.

Using hand files, enlarge the apex 3 sizes larger (or 15 units on your K-file). Then step back 4 sizes (or 20 K-file units), going a half millimeter shorter for each larger K-file size. Thus, if your first to bind was a #20, then you should enlarge the apex to a #35, and step back to a #40 at 0.5 mm short of working length, a #45 at 1.0 mm short, a #50 at 1.5 mm short, and a #55 at 2.0 mm short. Finally use your rotary files to blend to the top of the apical prep into the coronal area that you had previously instrumented.

Aggarwal V, Singla M, Miglani S, Kohli S, Singh S. Comparative Evaluation of 1.8 mL and 3.6 mL of 2% Lidocaine with 1:200,000 Epinephrine for Inferior Alveolar Nerve Block in Patients with Irreversible Pulpitis: A Prospective, Randomized Single-blind Study. J Endod 2012;38:753-6.

This study compared the effectiveness of one versus two carpules of anesthetic on the success of an inferior alveolar nerve block (IANB). Using a prospective randomized controlled trial, the authors randomly gave 1.8 ml or 3.6 ml of 2% lidocaine with 1:200,000 epinephrine via IANB to 55 patients with symptomatic irreversible pulpitis in a lower molar. After it was confirmed that the block was successful by profound lower lip numbness, access and pulp extirpation was performed. If the patient experienced pain, the procedure was stopped and the patient rated their level of pain. Success, defined as no or mild pain, was achieved 26% of the time using 1.8 ml and 54% with 3.6 ml, which was a statistically significant difference. *SUMMARY: The success rate of an IANB can be increased by using two carpules of anesthetic (instead of one carpule), though neither method provides perfect anesthesia if the patient has symptomatic irreversible pulpitis in a lower molar.*

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