

Saving Teeth Through Nonsurgical Endodontic Retreatment

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How successful is endodontic therapy? When evaluating the prevalence of periradicular disease, epidemiological studies report a 60 to 75 percent success rate in general practice¹ compared to a 90 percent success rate in controlled clinical studies² with initial endodontic treatment. It should not be surprising that proper operator technique pursuant to elimination of organic and microbiological irritants from the root canal system is of paramount importance in long-term tooth survival. Teeth whose canals are well obturated to correct length³ and those that are well restored⁴ with proper coronal coverage⁵ survive at higher rates than those that are not.

Certain factors, however, independent of operator control, will negatively influence outcome. Perhaps the most influential factor is the presence of apical periodontitis, which can decrease the prognosis by 14 percent.⁶ Vital teeth are also more successful than necrotic ones.³

When initial therapy fails, we must advise the patient if endodontic retreatment is a reasonable option, and if so, whether it should be conventional (nonsurgical) or surgical.

As a group, retreatments are not as successful as initial therapy cases. Certain factors will adversely influence the outcome. Gorni, in a two-year follow-up study, found success dropped from 86.8 percent to 47 percent when alterations in the anatomy, such as transportations, perforations, stripping, and unsealed resorptions, were present.⁷ The Toronto Study observed the four- to six-year outcome of conventional retreatments by graduate endodontic students.⁶ They found an overall success rate of 81 percent. When preoperative apical periodontitis was present, the success rate was 78 percent; when absent, it was 97 percent.

Retreatment cases are typically infected with more resistant microflora, and often require complicated techniques to gain access to the root canal system. Some of the categories that must be mastered include removing obturating materials, posts, and separated instruments, bypassing blocked canals, locating missed canals (see Figures 1 and 2) and repairing perforations.

Many of these procedures can be done through minimally invasive access openings achievable only with the use of the operating microscope (see Figures 3 and 4).

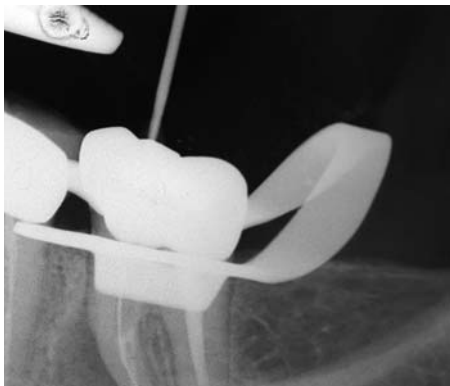


Figure 1. Starting film (top) of a tooth that had root canal treatment 14 years ago. Lateral mesial root area may indicate fracture or egress of irritants through a lateral canal. Also may indicate possible transportation of apical foramen. Radiograph (bottom) shows guide file in previously missed ML canal, which branched off of the main canal at mid-root.

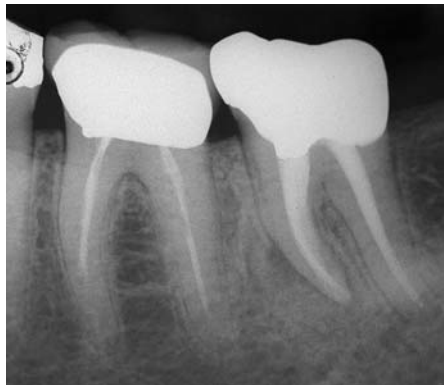


Figure 2. Main canal with MB and ML bifurcations filled (top) and eight-month recall (bottom) showing progression of osseous repair.



Figure 3. The starting film (top) shows a tooth that was acutely percussion sensitive. Retreatment of the buccal canals eliminated the symptoms. The post and palatal canal were not treated.



Figure 4. This result was achieved through a small access opening utilizing the microscope. Bottom photo shows gutta-percha at the chamber floor level.

While new technology can make certain aspects of endodontic care easier, we should not be seduced into thinking that it has become a substitute for hard work and good clinical judgment.

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Implants are an option when a hopeless or poor prognosis exists for endodontic retreatment. Many clinicians don't realize the potential that nonsurgical retreatment can offer. Rather than extraction, possible grafting, crown placement, and added cost, many teeth can be saved utilizing the existing restoration (see Figure 5).

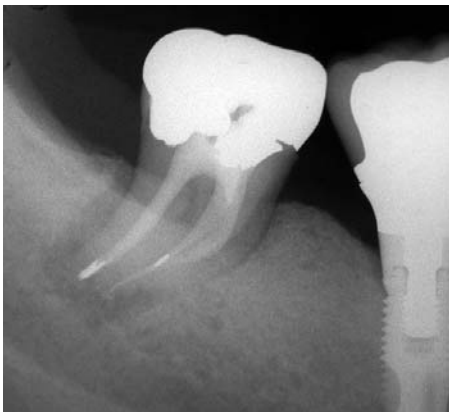
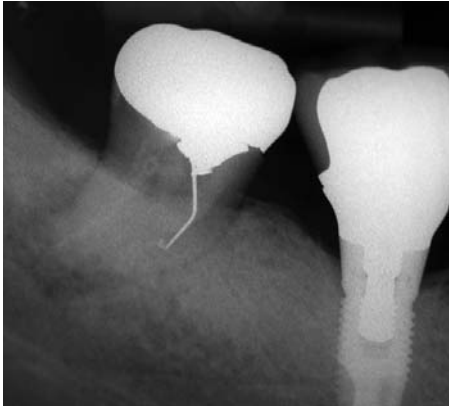


Figure 5. The starting radiograph (top) revealed considerable bone loss. Pockets were 1-2 mm. The tooth was retreated (center) and observed at a one-year recall (bottom). Repair is quite advanced.

Periapical surgery performed to eliminate infection is technique sensitive, as are all phases of dentistry. Additional foramina and isthmuses between foramina can be difficult to visualize and seal. If not done precisely, infection will not resolve. Conservative retreatment can solve many of these problems, as well (see Figure 6).



Figure 6. The starting radiograph (top) shows a failure in the surgical retreatment. Note slight off-center location of canal. The tooth was retreated (center) and a lingual canal was located, disinfected, and obturated. Surgery failed to seal the lingual apical foramen. Photo at bottom shows six-month recall.

Root canals are often morphologically complex spaces that do not have circular cross-sectional diameters. The mesial root in lower molars, for example, can have an interconnecting isthmus between the mesio-buccal (MB) and mesio-lingual (ML) canals harboring tissue and microorganisms (see Figures 7 and 8).



Figure 7. The starting radiograph (top) reveals apical periodontitis around the mesial root. The mesial root was retreated (center), and a mid-mesial canal was located and merged with the MB canal in the apical half. The ML, MB1, and mid-mesial canals had a common apical foramen. A one-year recall (bottom) shows healing well under way.

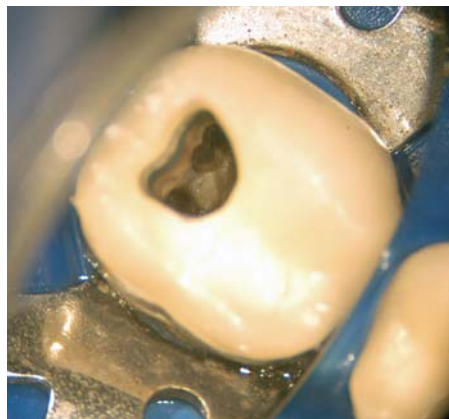


Figure 8. The left photo shows finding the mid-mesial (MB2) canal. The right photo shows the canals opened.

There is up to a 15 percent chance that within this space, a third canal can be located that may be independent with a separate foramen, or that may join apically with either the MB or the ML canal.⁸ The ability to disinfect as much anatomy as is possible to locate—and not just that which is easy to find—is the key to long-term endodontic success.

We are living in an age of hype, advertising, and monetary bottom lines.

Individuals and companies are marketing products that make endodontics seem simple. They will make you believe that all one needs is a set of nickel-titanium rotary files and that a root canal procedure can be done in one visit. While new technology can make certain aspects of endodontic care easier, we should not be seduced into thinking that it has become a substitute for hard work and good clinical judgment. ■

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