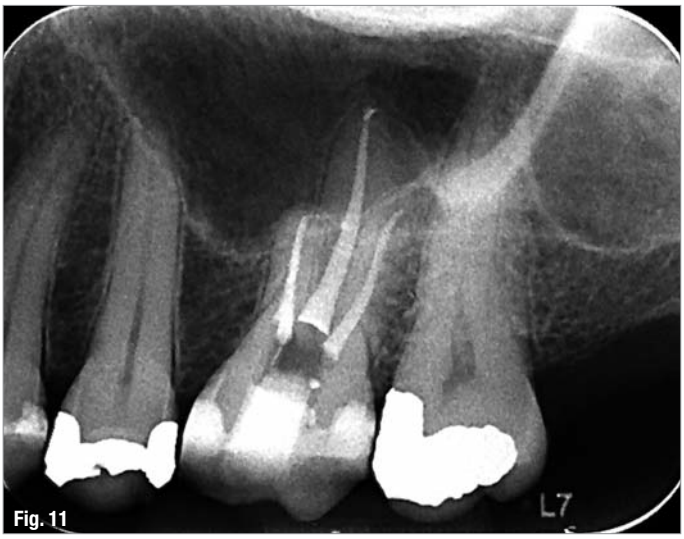


Fig. 11

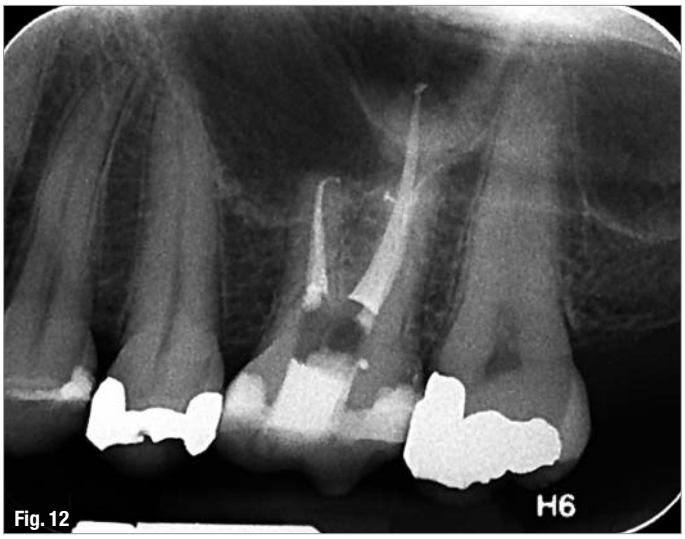


Fig. 12

Fig. 11_Post-op radiograph, revealing—to a limited degree—the multiplanar curvature of the DB canal and the apparently straight MB canal form. Note the conservative, mesially angulated access cavity preparation and the filling material in the distal pulp horn, which was intentionally left unroofed to preserve coronal tooth structure.

Fig. 12_Shallow, distally angulated post-op radiograph, revealing the severe apical curvature of the MB canal system and the mid-root lateral canal in the palatal canal that spotted the middle of the paper point in Figure 10 with blood.

nating from her left sternocleidomastoid muscle). A phone call four days later confirmed that she had no spontaneous pain referral, just the expected soreness to biting pressure.

So, looking back at this case, why the misdirection and wrong turns?

Firstly, my initial hypothesis about the aetiology of her chief complaint was misdirected by the lack of thermal sensitivity and by the pain she described in her neck region. Ironically, the patient did not relate thermal sensitivity because she does not care for really hot or cold foods or beverages and therefore had not thermally challenged tooth #14. As to the muscle tenderness outside the EZ, when I heard her describe this referral of pain below her mandible, I assumed she also had trigger-point myopathy in her masseter and temporalis muscles, the muscles that commonly refer pain *into* the EZ.

Regarding the first endodontist needlessly treating tooth #19 and failing to resolve the original aetiology of the patient's pain syndrome, it is a profound truth that endodontic disease becomes less obscure and easier to diagnose with time. Therefore, being the second one in on the case undoubtedly was an advantage at some level. With that said, a pulpal status like this one (partial necrosis) will return a WNL cold test response, albeit a delayed and vague one, virtually every time.

Interpreting sharp but transient responses to cold testing as indicative of irreversible pulpitis is a very common mistake. Until sharp, prolonged responses are seen—ideally with identical reproduction of the patient's pain—clinicians must obtain further pulp testing results outside of normal limits before they start diving into pulp chambers. In this case, every tooth—except #19 (no response) and 14 (delayed, vague)—responded in a very sharp but transient manner. I had no doubt that #19 responded the same way before it was treated, as evidenced by the endodontist's secondary treatment plan of accessing #20, a perfectly healthy tooth.

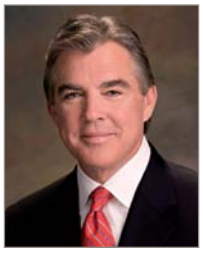
Partially necrotic pulp is nearly impossible to diagnose without using a sustainable source of heat. Classically, partially necrotic pulp responds to cold tests WNL, although sometimes cooling the tooth will alleviate the pain. Unless a heat stimulus is applied, thereby increasing the pressure inside the dead space, patients will be left in pain until the remaining pulp dies and clinicians will feel inclined to cut access cavities until the patient's pain is relieved.

We can and must do better than diagnosis by access._

Please visit www.endobuchanan.com for video clips of this case.

_about the author

roots



After 30 years, **Dr L. Stephen Buchanan** continues to enjoy his Santa Barbara, California, practice limited to conventional and microsurgical endodontics, as well as implant placement. He also teaches part-time at University of Southern California; University of California, Los Angeles; and every month in his state-of-the-art Santa Barbara teaching facility—Dental Education Laboratories.

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