

THE THREE DIMENSIONS OF ENDODONTIC CBCT:



by Rowshan Ahani, DDS, MS

The days of “doctor knows best” are long gone. Nowadays, we consistently have to earn the trust of our patients—and their referring dentists. To this end, clarity and transparency are absolutely paramount when proposing a treatment plan. When you allow the referring dentists to clearly understand the reasoning behind the treatment plan for their patients’ care, they feel more comfortable with your treatment-planning choices. Using a CBCT image can greatly simplify what may otherwise sound like a very complex treatment plan.

For example, a patient referred by my colleague presented with irritated gums over tooth #11. Clinical exam and periapical radiographs revealed a buccal external resorptive lesion on tooth #11 (Figs. 1 & 2). A CS 8100 3D scan was taken to evaluate the depth of the resorption, and an oblique axial slice of the scan revealed that the defect had extended into the pulp of the tooth (Fig. 3).

Because the treatment plan required both a root canal *and* a surgical procedure—something that many doctors would find excessive—the oblique sagittal slice (Fig. 4) was sent to the referring dentist, who was amazed to see the clarity of the image and quickly understood my treatment-planning rationale. When you can point to the hole in the tooth and show that it goes into the nerve (Fig. 5), this conversation takes about one minute. With the aid of 3D imaging, both the referring dentist and our patient quickly understood and accepted the treatment plan.

At our next visit, the tooth was accessed and instrumented. A lubricated gutta-percha point was placed inside the canal and a surgical flap was reflected, exposing the defect. The defect was then restored with a resin-modified glass ionomer. The gutta percha in the canal served to prevent the restorative material from flowing into the open canal space. The

restoration was shaped and the gingiva was sutured back in place.

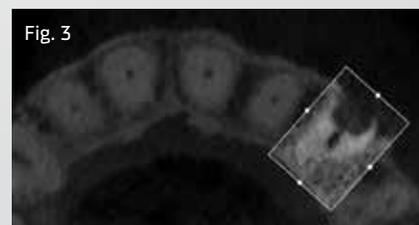
At this point, the rubber dam was replaced and the root-canal treatment and bonded composite core buildup were completed (Fig. 6). The entire procedure took about 90 minutes, and the patient was thrilled to be able to save his tooth.

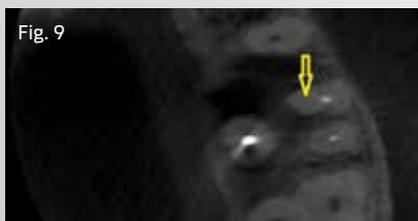
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Using 3D imaging to educate our patients and referring dentists

While we often talk about how cone-beam CT technology is invaluable as a diagnostic and treatment-planning tool, time and time again I find that the use of 3D imaging technology facilitates communication with my colleagues and our mutual patients.

In 2010, a 29-year-old male patient was referred to my office by his general practitioner after complaining of pain and swelling associated with tooth #14. After the periapical X-rays were reviewed





(Fig. 7), a CBCT scan was recommended and taken to further assess the lesion. The CS 9000 3D scan revealed a large PA lesion, which included the furcation of the tooth. The existing root-canal treatment appeared inadequate and there were screw-type posts in the mesiobuccal and palatal canals (Fig. 8). A missed MB2 canal was also noted (yellow arrow, Fig. 9).

restoration, the two posts and the gutta percha were removed. The missed MB2 canal was located and all four canals were debrided, shaped and irrigated with sodium hypochlorite and EDTA. The canal system was packed with calcium hydroxide and the tooth temporized until the subsequent visit two weeks later (Fig. 10).

When the patient returned, he was

THE PATIENT WAS EXTREMELY GRATEFUL TO HAVE SAVED HER TOOTH WITHOUT ANY ADDITIONAL PROCEDURES. IN LOOKING BACK AT THIS CASE, THERE IS NO TELLING HOW IT WOULD HAVE TURNED OUT WITHOUT THE BENEFIT OF THE CBCT.

My initial assessment of this tooth was that the prognosis for retreatment was poor, so I recommended extraction and replacement with an implant or possibly a fixed bridge. The patient was adamant that if there were any hope at all, he wanted to try to save this tooth. With this understanding, we proceeded with retreatment.

After the consultation appointment, I reviewed the CBCT scan with the referring dentist, highlighting the challenges presented by this retreatment. This allowed me to set reasonable expectations for the long-term success of the case.

Without the information provided by 3D scans, colleague collaboration in interdisciplinary cases would be much more challenging.

During the first visit, the existing

symptom-free and all of the swelling was gone. Root-canal treatment, a post and bonded composite core buildup were completed (Fig. 11). He was advised to have final restoration and return for follow up X-rays in six months to assess healing. He returned four years later for an unrelated tooth. During this visit, a follow up X-ray was taken, revealing complete healing of the lesion (Fig. 12).

Using CBCT technology to instill trust in patients and referring doctors

A third case that demonstrates the benefits of incorporating endodontic CBCT to improve colleague communication involves a healthy, 26-year-old female patient with a history of trauma

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Fig. 13

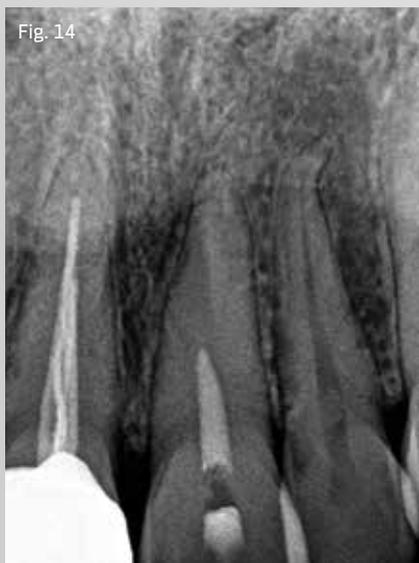


Fig. 14



Fig. 15

to her upper anterior teeth as a child. Tooth #9 had recently become sensitive to percussion. The periapical radiograph revealed a completely calcified pulp canal with a relatively normal PDL space (Fig. 13). Pulp testing resulted in a diagnosis of necrosis with symptomatic apical periodontitis, and I recommended treatment.

The patient reported that her general dentist wanted to schedule her for the root-canal treatment on this tooth, but she had elected to find a specialist on her own. She found our office based on online research.

In this case, I didn't feel that a pre-operative CBCT would be as valuable as a possible intraoperative scan. Following a careful review of risks, benefits and alternatives, we proceeded with treatment and the tooth was accessed. After searching for the canal with ultrasonic instruments to a depth of 15mm, the tooth was packed with calcium hydroxide and the access was closed with a temporary filling. A periapical radiograph revealed that my access was slightly off center (Fig. 14). A CBCT scan with the CS 8100 3D was taken and the patient was scheduled for a follow-up appointment.

The CBCT scan revealed that my access was slightly lingual and mesial to the location of the canal (Fig. 15). The

patient arrived for her subsequent appointment with a high degree of trepidation. She asked many questions about what might happen if we were not able to locate the canal. While I truthfully advised that apical surgery or extraction may be an option, I very confidently advised her that, armed with my 3D scan and my microscope, I should be able to readily locate the canal and complete the case.

Indeed, 15 minutes after placing the rubber dam and removing the temporary filling, I was able to direct my ultrasonic instrument 0.5mm in the distobuccal direction and locate the canal. Once the canal was located, the root-canal treatment and bonded composite core buildup were completed uneventfully (Fig. 16).

The patient was extremely grateful to have saved her tooth without any additional procedures. In looking back at this case, there is no telling how it would have turned out without the benefit of the CBCT. There is a much higher likelihood that the tooth would have been weakened or even perforated in looking for the canal.

When I reviewed the images with her dentist, who had initially proposed performing the root canal himself, he was surprised by the degree of difficulty of this case and was very relieved not to have attempted it. This kind of interaction between the specialist and referring dentist is a great way to build bridges and increase future referrals.



Fig. 16

Connecting with referring doctors through CBCT technology

Clinical cases are just one way of marketing my practice—and technology—to referrals. As a specialist, I always enjoy going to lunch with general practitioners to discuss how I can help their

patients. My cone-beam CT unit gives dentists a reason to come to my office so they can understand the patient experience. It's great to show visiting practitioners what the system is like and how it functions in my endodontic practice. One thing I particularly like to do is pull up their patients' cases so I can go through them in detail using the 3D software,

rather than the cursory overview of sharing only the resulting findings.

As a professional, I find it is critical to be comfortable with modern technologies as they emerge. In endodontics, the emergence of cone-beam CT has dramatically enhanced our ability to diagnose, treatment-plan and execute procedures with greater confidence than ever before.

Also, because we provide excellent care using the most modern instrumentation, the office practically markets itself. When used properly, CBCT helps build relationships with both the patient and the referring dental professional, and working with like-minded dentists makes practicing more rewarding in every way. ■

What's your experience with CBCT? Comment online at www.dentaltown.com/Dentaltown/magazine.aspx

Author Bio



Dr. Rowshan Ahani is a graduate of the UCLA School of Dentistry. He earned his certificate of endodontics and MS in oral sciences from the SUNY Buffalo. Dr. Ahani is a diplomate of the American Board of Endodontics and maintains a private endodontic practice, Bayside Endodontics, in Daly City, California.



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