Why CT Scans Are Already the Standard of Care

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Abstract:

Standard of care has long been considered the reasonable care provided by dentists in good standing in the same neighborhood. With the ease of access and widespread use of the Internet, the dentist's local neighborhood no longer has defined boundaries but, rather, minimally encompasses the United States. This article challenges the responsibility dentists have relative to whether they recommend treatment modalities that may benefit the patient but that they do not personally offer or perform. To this end, 3-D imaging is compared to conventional 2-D radiographs relative to implant placement and the new standard of care.

"IT IS A DENTIST'S RESPONSIBILITY to provide reasonable and ordinary care, skill and diligence as other dentists in good standing in the same neighborhood provide, and deviations from these standards that produce untoward results constitute malpractice."

These words were cobbled together from multiple definitions of the standard of care. They are not to be construed as legal "gospel." Rather, they are intended to provoke discussion regarding which treatment options we choose to present to patients and which we avoid without even presenting them for consideration.

For instance, what is the standard of care when replacing a single missing tooth? What if a dentist has never inserted an implant or prefers (and likes) fabricating three-unit bridges?

Does an implant still have to be presented as an option to the patient, regardless if the adjacent teeth are pristine or already have been restored?

Do we avoid sinus grafts as a treatment option—they're predictable and would solve the patient's need for posterior maxillary implants—or do we recommend some alternative restoration or surgery because we do not perform sinus grafts?

Do we use only one type or length/width of dental implant for all clinical situations while knowing that a larger inventory or another implant system would produce better results?

Do we eyeball every implant insertion when a surgical guide may aid in the placement?

Do we choose to limit decision-making to conventional two-dimensional dental/digital X-rays and/or panoramic images, knowing that there is a 3-D CT scanner around the corner or miles away but still in reasonable traveling distance that would enable a better treatment plan and a more precise and safer implant placement?

Lumped together, each practitioner needs to ask and answer the following question: Do we always do what is best for the patient even if it means referring the patient elsewhere for a part or all of the service, or do we base all treatment options on keeping treat-

ment "in house?" And is the treatment "in house" equivalent to what the patient could reasonably receive elsewhere in the local dental community?

The trouble is, and the law says, that we have a greater responsibility than providing the best dental care we can possibly give our patients. We need to make them aware of the best possible care that exists in the local community when compared to services provided in our offices. That is not anything most of us are comfortable doing, yet that's what "standard of care" is all about.

Case One

A 60-year-old female (Figure 1) patient presents to her dentist in good heath with the chief complaint that she would like an anterior bridge removed and implants inserted so she could have "individual teeth." Her hygiene was impeccable, and she no longer wanted to use a floss threader now she that she was aware of dental implants and their proven success.

From a practice management perspective, is it best to remove the existing bridge before referring the patient to the surgeon for implant placement? Or, should the dentist, who does not insert implants, refer the patient for an implant consult before proceeding with treatment? What would be the standard of care in this case? And what radiographic information is needed to make a decision? Is the dental X-ray in Figure 1 adequate to determine the best course of treatment?

In this case, the dentist referred the patient to a dental CT lab to make certain implants could be inserted before he removed the existing prosthesis. Figure 2 reveals that the edentulous ridge was bi-cortical and without cancellous bone. The surgeon felt this site was not a good candidate for implant placement and used the CT images to explain why to the patient. Furthermore, the surgeon felt that any sort of ridge augmentation would be compromised, and there was a chance that the resulting esthetics would be unsatisfactory.

Here, the CT scan provided the opportunity "not" to attempt a case that could have yielded disastrous results.

Consider for a moment the dilemma if the dentist had removed the bridge and fabricated an acrylic provisional restoration. Who would pay for the final prosthesis after the surgeon declined to perform surgery?

Case Two

In the next case, let's explore how panoramic images skew treatment decisions. Figure 3 demonstrates a panoramic view in SimPlant. The treatment plan was to insert two implants where teeth #14 and #15 were missing. Options included inserting the appropriately sized implants into the available bone using an osteotome technique to insert longer implants, perform a sinus graft and wait for healing or insert implants at the time of surgery.

Since enough bone appears under the sinus to use osteotomes, let's explore what would happen if only this two-dimensional panoramic image was used, as opposed to a 3-D CT scan.

Figure 1. 60-year-old patient desires implants.

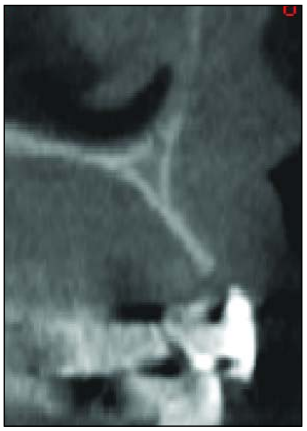

Figure 2. Bicortical ridge.

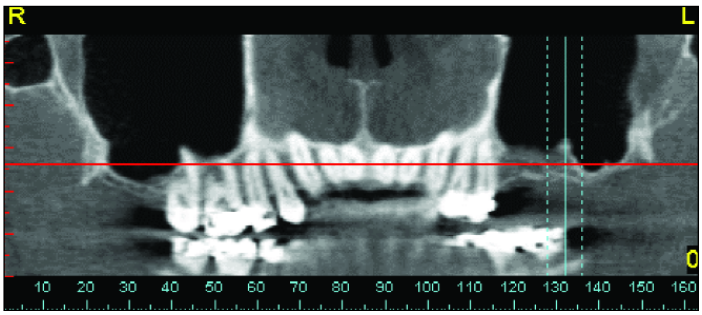

Figure 3. Panoramic image appears to indicate adequate amount of bone under left maxillary sinus.

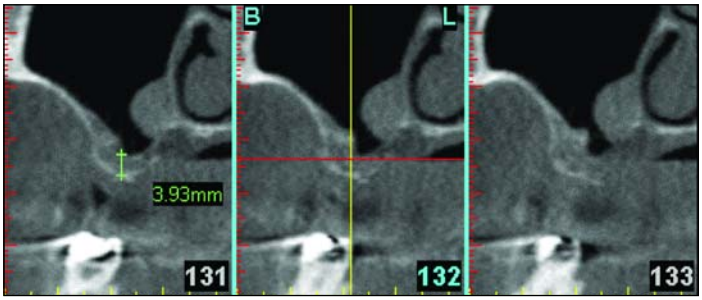

Figure 4. Cross-section reveals different perspective, which gives illusion that thick buccal wall of bone projects on panoramic view. Reality is, only about 4 mm of bone exists under floor of sinus.

Figure 4 reveals more information that would help the surgeon insert the implant. What appeared on the panoramic view in site #15 to be at least 10 mm of bone, measures only 4 mm from the center of the crest, and a polyp is noted on the medial wall of the sinus that was hidden from view. In actuality, thick buccal bone gave the impression that enough bone was available to easily insert an implant without the need for more information.

It is not in the scope of this paper to discuss treatment, but what surgeon wouldn't want this information in order to provide the best possible care?

Going the extra mile for more information can no longer be considered a "standard of excellence" that separates one clinician from another. Getting all the information necessary—in this case,

3-D imaging—to make an informed decision should not be glossed over by the mask of "judgment" or leaving the "option" up to the patient. There are no options to standard of care.

What about using 3-D imaging as a postsurgical tool? In Figure 5, we note that a graft was performed in the maxillary left sinus. The height from the alveolar crest measures almost 20 millimeters. Does a panoramic view provide enough information to proceed with implant placement? Consider a 3-D transaxial image of the same site (Figure 6).

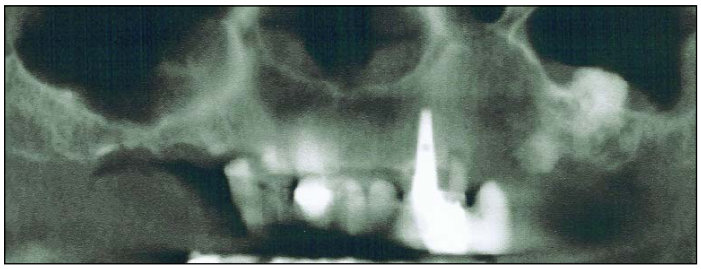

Figure 5. Panoramic image reveals adequate amount of bone in maxillary left after sinus graft surgery.

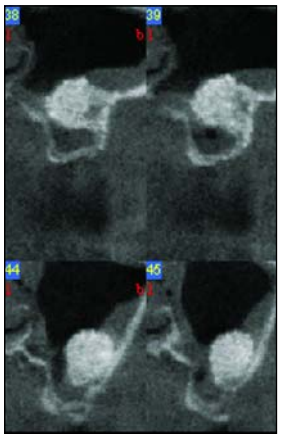

Figure 6. Cross-sectional view demonstrating sinus graft attached to medial wall but not extended to floor of sinus.

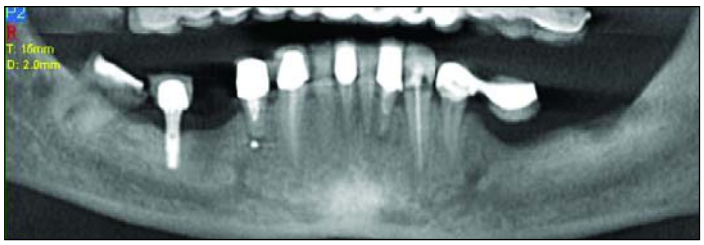

Figure 7. Panoramic view indicates adequate bone between apex of implant and mandibular nerve.

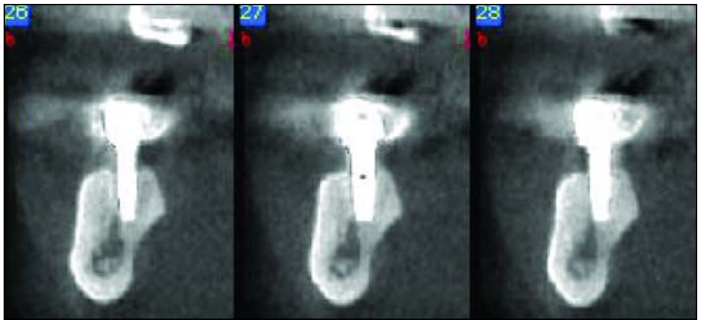

Figure 8. Sagittal image implant #30 site shows nerve touching aberrant branch of mandibular nerve.

Imagine how quickly the bur would perforate the thin alveolar crest, puncture the sinus membrane, and either embed into the graft or dislodge it from the lateral sinus wall. How would it be explained that the loose bone graft "rattling" around in the sinus could have been avoided had the surgeon prescribed that the patient get a CT scan prior to surgery? All too often, dentists feel obligated—especially when it comes to radiographic imaging—to make decisions based on the patient's funds or insurance reimbursements, or because they simply think that 2-D X-rays are adequate for the intended treatment. What is the radiographic standard of care for any augmented site after bone grafts have been performed?

Case Three

As a last case, consider the following. A dentist insets an implant in the #30 site. Preop analysis indicated that enough bone existed above the nerve that a 3-D CT scan was not recommended. The surgery was uneventful, yet when the local anesthetic wore off, the patient complained of continued paresthesia. Since there was no apparent reason for the lingering paresthesia, the dentist sent the patient for a postop CT scan.

Figure 8 demonstrates that the implant was touching an aberrant branch of the mandibular nerve that was not viewable on the panoramic image but was easily visible on the cross-sectional view.

Summary

It is difficult to identify when a procedure or technique transforms from a standard of excellence into the standard of care. And while it may be equally difficult to know when a new technology, technique, product or therapy emerges as a part of many of the local dental opinion makers' armamentarium, there is a time when a dentist can no longer say, "I know about this or that, but I choose not to recommend it for my patients."

Furthermore, one of the reasons for taking a 3-D CT scan is not because something is suspected that may interfere or alter the patient's treatment. Rather, CT scans should be recommended for the unexpected, to make certain we're not missing anything even though for all appearances the 2-D X-rays look "normal."

At the time of this writing, a prominent California lawyer is consulting with major dental insurance companies to create a new "Informed Refusal" document. This document suggests that dentists not only recommend 3-D imaging for complex cases, but that they have the patient sign a document should they refuse to do so. The converse may also exist. Will it be malpractice not to make the recommendation and subsequently not need to provide the "Informed Refusal" for the patient's signature? You be the judge. ■

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