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3-D imaging—the inside view

As a reader of *Implant Practice US*, I always discover new concepts that help to make me a better dentist. In this issue, articles run the gamut of every aspect of the implant process, from how to effectively communicate possible treatment options to patients to implants that improve hard and soft tissue response, to how to keep implants in good condition with water jets. One of the most rewarding aspects of my chosen career as an Oral and Maxillofacial Surgeon is that in my own practice I learn something every day that enhances my skills and helps me to improve patient care. As important as it is to read about these concepts in implantology, my ultimate goal of successfully implementing these notions poses challenges that are as individual as my patients.

Over the last 30 years, implants have evolved in shape, size, surface characteristics, and prosthetic alternatives. When chosen correctly, we know that they will nearly always integrate and become a lasting part of a patient's dentition. While not too long ago, it could have taken 6 months to a year to complete the implant process, immediately placed implants, abutments, and prosthetics, such as the ones also discussed in this issue, considerably shorten the time between extraction and tooth replacement.

With all of the improvements in implant products, the challenge still remains to find the best position to place an implant for both function and esthetics, while causing no harm to surrounding vital structures or the patient. To this end, the use of preoperative three-dimensional (3-D) radiography has become a valuable source of information for planning and implementation of more precise implant procedures. Since the incorporation of cone beam radiography into my office (i-CAT from Imaging Sciences), I have been pleasantly surprised to find that what I encountered in the jaw during surgery was virtually identical to what I had anticipated from seeing the i-CAT scan. I became far better prepared for surgery.

3-D radiography makes it possible for dentists to see vital structures that can dramatically affect the success of procedures, for example: the location, angulation, and subtle differences in alveolar bone; the location, size, and position of the inferior alveolar nerve canal; the mental foramen, nasal cavity, and maxillary sinuses.

While 3-D machines come in several fields of view, my full-field-of-view model also lets me see the true anatomy of the upper and lower jaws, the orbits, the cheekbones, and sinus cavities. Preoperatively, even with a tooth still in place, I can determine if enough bone is available to place an implant at the same time as the extraction and, sometimes even more importantly, if the implant should not be placed at all. These 3-D data, plus the ability to rotate the virtual anatomy 360 degrees in space or zoom in on and enlarge areas of interest, help me to do the right thing before I pick up my scalpel, rather than changing my plan after discovering anatomic shortcomings in mid-treatment.

A postoperative 3-D scan allows me to improve my care for the future. In necessary cases, I can take a follow-up scan and critically evaluate my implant placement. As a result of having this technology in my office, I can take swifter action to rectify a situation, if necessary, and get the healing process back on the right track. Yet another benefit of cone beam is its compatibility with third-party software for stereolithic models and surgical guides, which makes implant placement even easier and more predictable.

Besides the obvious clinical benefits I derive from my 3-D technology, my patients are also rewarded by seeing the preoperative scans in all of their 3-D detail. It helps them to understand the reasons, the realities, and the risks associated with treatment.

Implants give patients greater options for their dental treatment, and 3-D imaging gives the dental professional more of the information necessary to help ensure success in this endeavor. Enjoy this issue of *Implant Practice US* and the learning opportunities that new technologies offer to our practices!

Steven A Guttenberg, DDS, MD

Dr Guttenberg is an oral and maxillofacial surgeon, practicing the full scope of his specialty in Washington, DC, where he is Director of the Washington Institute for Mouth, Face and Jaw Surgery. He is a Diplomate of the American Board of Oral and Maxillofacial Surgery and a Fellow of the American Association of Oral and Maxillofacial Surgeons and of the American College of Oral and Maxillofacial Surgeons, of which he is a

Past-President. Dr Guttenberg is a member of the teaching staff at the Washington Hospital Center and is the chairman of its Oral and Maxillofacial Surgery Residency Training and Education Committee. He is a frequent lecturer throughout the United States and abroad. Dr Guttenberg has written numerous scientific articles and book chapters which have been published in the dental and medical literature.