

# Cone beam's role in the rising demand for implants

According to information released in February 2011 by the Millennium Research Group (MRG), a medical technology market intelligence company, dental implants are going to be among the "stand-outs" in terms of growth over the next five years.

"The esthetic and dental areas have consistently shown greater than average growth," says April Chan, publications manager at MRG, who added that dental implants are expected to show a growth of nine percent.

The American Association of Oral and Maxillofacial Surgeons (AAOMS) notes that a successful implant experience takes cooperation and coordination between all parties involved – including the patient, the restorative dentist and the oral and maxillofacial surgeon.

Close communication between all members of the implant team results in better understanding and implementation of the proper protocols during the process, and the precise details for accurate implant diagnosis and treatment planning can be gained through cone beam computed tomography (CBCT). High-resolution, volumetric images and measure-

ment tools provided by 3-D views facilitate thorough analysis of bone structure and tooth orientation, exact buccolingual dimensions, concavities and bone height.

Oral and maxillofacial surgeon, Dr. Steven Guttenberg, noted, "As an early adopter of CBCT, I have found it is indispensable for me as a surgeon to use this treatment tool for my patients. I cannot imagine placing an implant without the use of CBCT, especially when the case involves the extraction of difficult teeth that are close to the sinus, the inferior alveolar or mental nerve; the i-CAT scan is invaluable in terms of location to those anatomic entities."

Guttenberg said that the 3-D scans give him the details that are needed to treat the patient more efficiently: "When it comes to the diagnosis and treatment of maxillofacial trauma, whether a fractured tooth, fractured maxilla or mandible, zygoma or nose, the CBCT offers a tremendous amount of information so that I can do a better job for my patients." He added that technologies such as CAD/CAM and guided surgery techniques allow for even more effective treatment, and having a 3-D system with those

**Fig. 1** \_ Plan implants and their abutments and restorations simultaneously (i-CAT® Precise scan in Tx STUDIO™). (Photos/Provided by Imaging Sciences)



Fig. 1

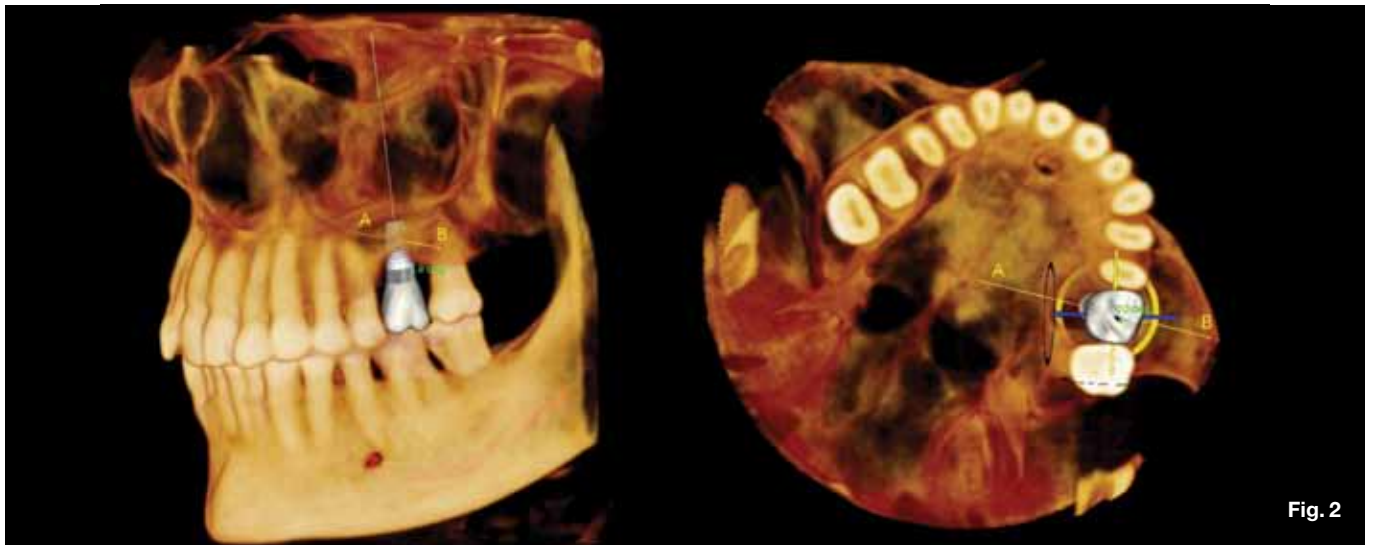


Fig. 2

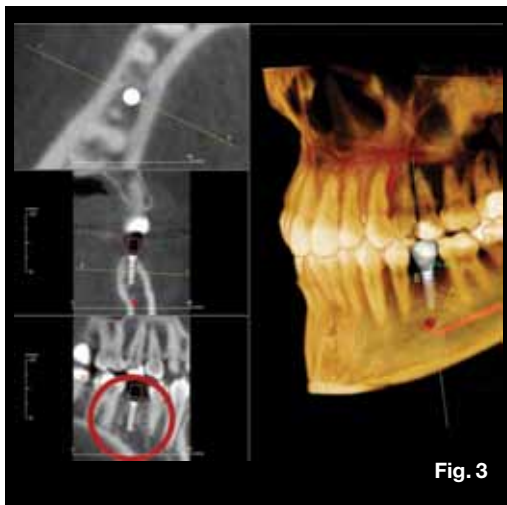


Fig. 3

Control over radiation dosage and scan settings gives clinicians the ability to tailor each scan to the patient. Through advancements in software and collimation technology, in-office cone-beam 3-D machines can “expose patients to minimal radiation, especially in comparison to medical grade CTs that we have used in the past,” said Guttenberg.

Orthodontist Dr. Juan-Carlos Quintero noted, “Since I have had my CBCT, the results of making even the simplest treatment decisions based on anatomic truth, finally, have been increasingly surprising. It comes down to the difference between estimating and knowing.” Regarding radiation risks, he added, “The recent position statement issued on December 13, 2011, by the American Association of Physicists in Medicine [AAPM] on radiation risks from medical imaging procedures, hopefully will put much of the unnecessary and unfounded hysteria to rest, at least for the scientifically inquisitive mind.”

He said that with the imaging dose, especially taking into account the opportunity to capture scans in as few as 4.8 seconds, makes concerns “superfluous ... the levels are so low, almost nonexistent, compared to the 50,000–100,000 microsievert levels that the AAPM marks as beginning cause for concern.” Moody concurred: “Collimation and the ability to control the dose is really important to me as I only want to expose the patient to a minimum of radiation while giving myself the very best diagnostic information. i-CAT provides that for me.”

For diagnosis, planning and treatment implementation, cone-beam scanning provides the many elements of an efficient implant planning process — from surgical accuracy to communication with referring colleagues and patients. Guttenberg summed up by saying, “When weighing the benefits and the risks, 3-D scanning virtually always comes out on the positive side of benefits in regards to patient care.”

**Fig. 2** Axial with buccolingual and mesiodistal cross-sectional views (i-CAT Precise scan in Tx STUDIO).

**Fig. 3** Clinical control with flexible scan sizes (8 cm x 8 cm shown) plus collimation (i-CAT Precise scan in Tx STUDIO).

capabilities makes the practitioner’s job less stressful when “preparing for surgery such as extracting teeth and placing immediate implants alone or with third-party planning and stent creation software.”

Dr. Justin Moody noted that implant placement software cuts down on the time his patients must spend in the operatory, an advantage for both the clinician and the patient. “I can treatment plan any case with just a few clicks of the mouse, and the 3-D image allows me to plan my surgery in advance, significantly cutting down on the amount of chair time needed. With my Tx STUDIO™ software, I now have the ability to place virtual implants into my 3-D image, along with abutments and restorations, showing the patient exactly what I plan to do.”

Moody added that understanding the process makes patients more compliant and directly affects the longevity of the implant. He said that his cone-beam system, i-CAT, is compatible with all leading surgical guide providers, including Anatomage®, NobelGuide® and others, giving him the choice to choose the implant that is needed for the specific instance.