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Cone-Beam and 3-D Imaging for Dental Implant Planning: Lessons Learned

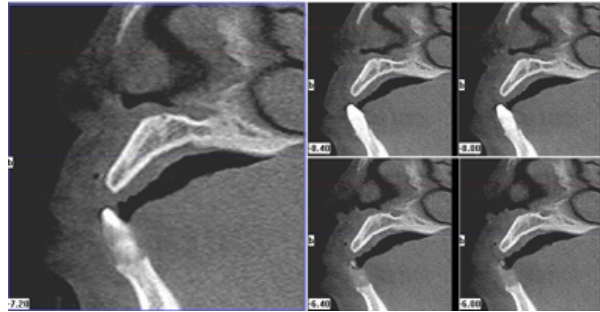
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3-D Cone Beam technology is not just the imaging method of the future. It's here, right now. It offers more accurate implant diagnosis, treatment planning, and treatment response monitoring than possible with 2-D radiography. A 3-dimensional scan of the head provides, within minutes, a dramatically accurate and completely undistorted virtual model of the jaws and face in 360 degrees...the perfect place to start!

Dentists should use these images of the jaw anatomy to place the implants with complete confidence. We live in a 3-D world yet visualize traditional x-rays as 2-D views. With 2-D radiographs, to gain all the needed information, one would need to take several images to see the jaw from different angles, to detect the height of the bone, the width, and then, a side view for the shape of the bone, in the buccal and the lingual aspect. Easier said than done. Even then, crucial details are lacking.

For instance, fenestrations and dehiscence may not be observable. Traditional 2-D x-rays can show what appears to be a large amount of bone without demonstrating the contour and thickness of the jaw. In contrast, because of its cross-sectional abilities, a 3-D scan reveals the actual and available bone that may be paper thin, but has good height and gives a false impression of the actual bone volume. Placing an implant in the area without the anatomical facts can result in soft tissue recession, exposed implant threads or failure. Knowing the clinical realities will allow clinicians to adjust the treatment plan to compensate for thin bone by building the implant foundation through augmentation and grafting. That's a lesson that no dentist or patient want to learn the "hard way".



For viewing a specific area, 3-D radiography lets the dentist zoom in and select desired 'slices' from all angles, axial, buccal-lingual, and mesio-distal. The results are crystal-clear pictures of bone quality and quantity—two crucial pieces of information for any implant procedure. Cone Beam scans present intense details, including soft tissue, missing teeth, location of the critical anatomy, ie. nerve canal, sinus, nasal cavity, existing pathology, adjacent teeth, curved roots and relationship between proposed implants and the opposite jaw.

When our practice incorporated our **i-CAT** 4 years ago, I made it a point to thoroughly familiarize myself with the system and its software. Once the anatomical knowledge is gained with the scan, the applications begin. The updates were available and seamlessly added to operating system. My favorite uses are "sharing" the data. When I seat the patient next to me at the computer console and view in real time the patient's data, they are "amazed and impressed" with our practice exactly at that point. It can only grow from there. My next favorite aspect is the "vision" feature that we can copy the patient file and share that with our referring teammate, without their needing any software. These are powerful practice-growth marketing considerations. While 3-D imaging gives the most precise preparation for implant diagnosis, planning, and confidence, it is in reality a lesson in better patient and practice care.

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