

THE TAKE-AWAYS

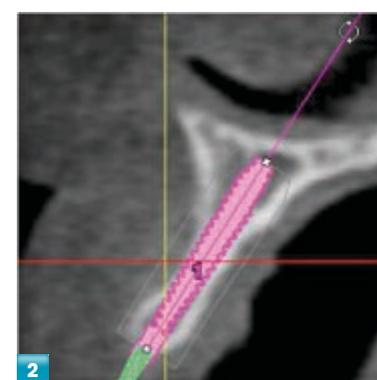
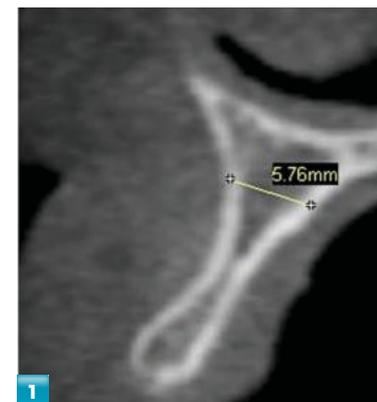
- All areas of the mouth, or areas to graft benefit through CBCT.
- CBCT can deliver simpler implant and bone graft cases.

Clinically speaking, 3D a must have

Part II of a three-part series on how CBCT is transforming treatment planning for implants.

by DR. MICHAEL TISCHLER

AT A GLANCE



FIGS. 1-3 Cross sectional view of anterior maxilla area showing thin mid buccal region (Fig. 1). Simulated CBCT view of implant placement (Fig. 2). Surgical view of implant placement in anterior region showing the need to graft at placement (Fig. 3).

THE TEAM

Bringing together a variety of voices for the best advice and big ideas.

TEAM MEMBERS

- Dr. Brien Harvey (Lead)
- Dr. Michael Tischler
- Dr. Lee Gause
- Dr. Joyce Warwick

ABOUT THE AUTHOR

Michael Tischler, DDS, is a general dentist practicing in Woodstock, N.Y. He is a diplomat of both the American Board of Oral Implantology and the International Congress of Oral Implantologists. He earned his fellowship with the AGD and American Academy of Implant Dentistry. He lectures extensively and received the Feltman Hunn Medal Of Merit Award in 2007 for his contributions to the field of dentistry.

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THE SET-UP

“With this article, Dr. Tischler continues to develop the protocol for utilization of cone beam CTs in the planning process for placement of implants. In certain cases there is no substitute for a CT, yet practitioners should always help their patients make informed decisions about their care, including whether or not to have a CT in each instance.”—DR. BRIEN HARVEY, TEAM LEAD

In the March issue of *Dental Products Report* I started a three-part series about treatment planning for dental implants with Cone Beam CT imaging (CBCT). In that article, the basics of CBCT imaging were outlined and the importance to treatment planning for dental implants was made clear. Also it was shown how by using various CBCT imaging companies such as 360imaging in Atlanta or nSequence in Reno, Nev., little investment is needed to use this technology.

In part 2 of this article, I will show the clinical relevance of CBCT

52% of GPs offer implants services in their practice.

Source: January 2010 DPR Speciality Care Survey

imaging to a dental clinician for simpler implant and bone graft cases.

A need for implants

According to the Centers For Disease Control, in 2004, 36% of adults over the age of 65 were missing 6 or more teeth, and according to the CDC, 14% of the same adult population in California is missing all their teeth. These facts certainly substantiate the need for implant dentistry. When you look at the literature, over and over again, dental implants offer the

WHAT'S NEXT?

Part III of the series...

Dr. Tischler will tie it all together with CT imaging for larger complex implant cases with multiple implants, and for implants in the esthetic zone.

Learning opportunity in June...

The International Congress on 3-D Dental Imaging returns for its fourth year to

deliver high-quality, valuable education for general dentists and specialists on the revolutionary technology of Cone Beam 3-D imaging for the dental practice.

Imaging Sciences International and Gendex Dental Systems proudly announce the 4th International Congress on 3-D Dental Imaging which will be held in La Jolla, Calif., June 25-26.

Experienced dental clinicians and professionals will share their vast knowledge of 3-D's past, where it is today, and where it's going in the future. These leaders in education also will offer their expertise on the practical applications of this dynamic technology—how it actually works in the clinical environment.



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best long term solution for tooth replacement both from a prosthetic survival rate and functional perspective.

CBCT imaging as outlined in part 1 of this article, is a large part of treatment planning for dental implants. As the U.S. population is living longer, the need to use CBCT imaging to replace missing teeth will only grow.

Using the latest technology

There is not one area of the mouth that should be excluded for a CBCT when treatment planning for dental implants or bone grafts. All 4 quadrants in the mouth, require a CBCT to prevent iatrogenic damage and avoid anatomical pitfalls. It is easy for a clinician to say it isn't needed, but when you look at the medical legal protection a CBCT offers, there is really no excuse not to have one.

In the anterior maxilla, a CBCT will show the amount of buccal and lingual bone and the corresponding angulation relevant for implant placement in this region. A cross sectional view on a CBCT of the anterior maxilla can show how thin the bone can be in the mid buccal portion (Fig. 1).

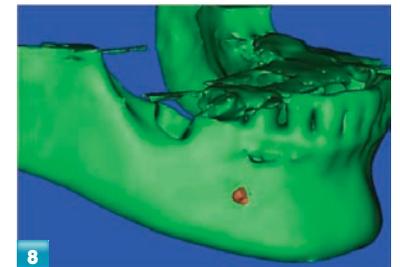
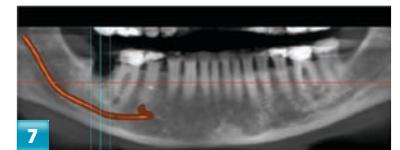
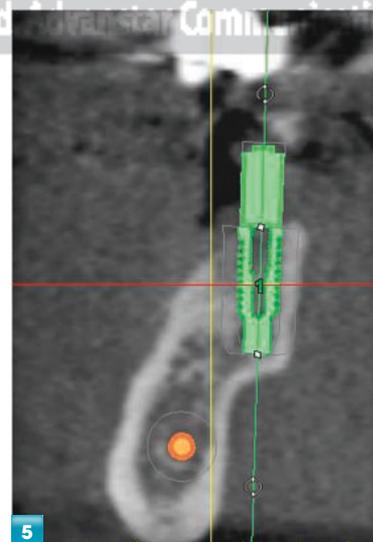
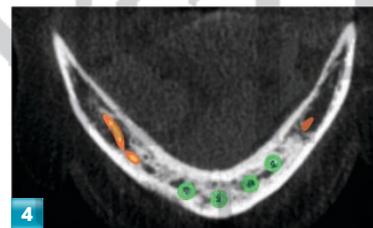
A 2D view from a panograph or periapical x-ray can not show this. The often thick palatal tissue in this region, is deceiving when attempting to gauge ridge thickness. A CBCT will accurately show the osseous position under this thick tissue.

A CBCT will show the position of the incisal foramen from an axial view which is crucial to treatment planning in this region. When replacing a missing lateral or central incisor, often the bone is concave on the buccal plate due to bone loss (Fig. 2). Only a CBCT can show this anatomy and allow appropriate planning (Fig. 3).

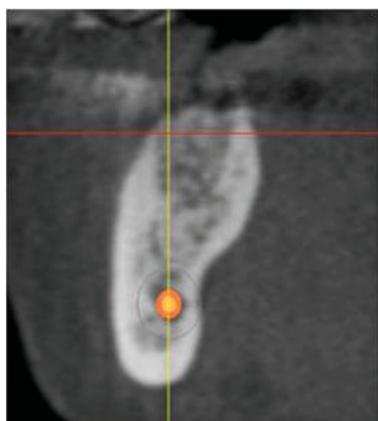
Essential in many cases

In the anterior mandible, a CBCT is indispensable. With a 3D view the positions of the mental foramen and mandibular nerve can be identified. It also can show the implant position in relation to other implants, so they are not too close (Fig. 4).

Often the lingual anatomy is concave in nature. Only a CT can show this accurately. A 3D view from a CBCT will show the angulations of planned implants. This is important in this area due to the dramatic angulations of the buccal and lingual plates.



FIGS. 4-8 Axial view of mandible showing implant positioning (Fig. 4). Cross sectional view showing lingual shelf (Fig. 5) and cross sectional view of posterior maxilla showing sinus membrane (Fig. 6). Fig. 7 shows pre-op pan view of defect in mandible, while Fig. 8 is a pre-op CBCT 3D view of defect in mandible.



FIGS. 9-10 DFDBA Putty Graft in place in mandibular defect (Fig. 9). Post-op healing of graft site in mandible (Fig. 10).

In the posterior mandible, a CBCT shows the lingual plate anatomy and the exact location of the lingual concavity (Fig. 5). This is crucial information when planning an implant case. Often 1 or 2 mm can make the difference between perforation through a lingual plate. The distance to the inferior alveolar nerve also can be measured to within 1/10 of a millimeter. When you compare this to the distortion on a panoramic, the relevance of a CBCT becomes even clearer.

Implant placement in the posterior maxilla is benefited immensely by having a CBCT. A cross sectional view can show the position of the sinus membrane and allow correct planning (Fig. 6). A CBCT also will show pathology in the sinus region and the possible need for a referral to an ear nose and throat specialist. If sinus grafting is planned, a CBCT will show the amount of graft needed and location to graft. The medical legal protection in this region from a CBCT cannot be overemphasized.

“There are many advantages when a CBCT is taken with a radiographic template showing the final prosthetic position of the teeth.”

Lastly the importance of using a CBCT for grafting bone must be pointed out. Without osseous support, dental implants cannot be placed. A CBCT taken pre- and post-operatively will aid in correct treatment planning. Figs. 7-10 show the pre- and post-graft images of a defect site in the mandible. There are many advantages when a CBCT is taken with radiographic template showing the final prosthetic position of the teeth. Once this final prosthetic position is seen on a CBCT, the bone graft can be planned to support that position. After healing, a second CBCT should be taken to confirm the planned bone growth and to plan the implant position.

Countless benefits

In Part II of this article, the clinical relevance of a CBCT has been shown. There is not one area of the mouth, or an area to graft that is not benefited through CBCT.

In each of the first two parts of this article, attempts have been made to show there is no reason not to have a CBCT for an implant and grafting case. In Part III of this article—coming later this year—the use of CBCT for more advanced cases of multiple implants will be shown. It is in these larger cases that CBCT becomes even more relevant. ●

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