



Elevating Implant Treatment: Triangle of Bone Concept Utilizing CBCT

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This is Part II of our three-part series on interesting topics covered at the 1st International Congress on 3-Dimensional Dental Imaging held in New York City two weeks ago. The meeting was hosted by Imaging Sciences International and i-dontics. Missed Part I? [Read it here.](#)

Introduction

At the 3D Dental Imaging conference, many new and profound developments in 3-D dental imaging technology were unveiled. These new developments enable dentists to visualize the internal anatomy of the head and jaws with unparalleled accuracy and clarity. This quantum leap in imaging technology enables dentists to treatment plan with confidence and precision previously unknown in dentistry.

Cone Beam 3-Dimensional Technology is vastly more accurate than prior attempts to scan and depict the internal anatomy of the head and neck. In fact, CBCT scans are so accurate that they can even be used for identifying missed canals in endodontic failures. The accuracy and resolution are that advanced. CBCT scans can also be used for identifying occult fractures of the crown or root that cannot be detected by any other means.

Triangle of Bone Concept Utilizing CBCT

One of the more interesting techniques discussed at the conference was the 'Triangle of Bone' concept. Dr. Scott Ganz developed the 'Triangle of Bone' concept to analyze bone quality, quantity and disposition at prospective dental implant sites utilizing CBCT scans. This provides a far more in-depth analysis than 2-dimensional radiographs.

Placement of a dental implant fixture to replace a maxillary central incisor can be challenging in many ways. Many factors have to be taken into account to generate an ideal plan for placement. Patterns of bone resorption and disposition of the buccal and lingual cortical plates can make orientation of the implant fixture difficult. Quality and quantity of cancellous bone can also be problematic.

Decisions have to be made regarding orientation of the long axis of the implant fixture, orientation of the implant fixture in the buccolingual and mesiodistal planes, exact drilling site, implant fixture diameter, length and form (i.e., tapered or cylindrical), depth of placement, orientation of platform to adjacent natural teeth or implants, and so on.

All of these decisions can be accomplished prior to surgery. This unparalleled accuracy in being able to analyze the prevailing conditions as they exist in the patient elevate the sophistication and predictability of treatment planning to new heights. This is the new benchmark in dentistry.

Using the Triangle of Bone decision tree, the projected implant site is depicted in a buccolingual slice from the CBCT scan. The apex of the triangle is oriented toward the height of the alveolar ridge and the projected site for the implant platform. The base is oriented toward the apical extent of the implant fixture and terminates at the most apical extent of the available bone. Volume and quality of the bone are assessed and used for accurate treatment planning prior to surgical placement. With an accuracy of one tenth of a millimeter, treatment planning is highly accurate. If bone grafting or reorientation of the dental implant is required, all can be accomplished pre-operatively.

The Triangle of Bone is used frequently to determine the ideal placement of implants to replace maxillary anterior teeth. In this area, disposition of the buccal and lingual cortical plates is critical. The Triangle can be imposed over this area to enable the dentist to ensure that adequate bone volume is available to accommodate the projected path of insertion. With CBCT scans, the dentist can accurately determine if bone augmentation is required and can identify areas where bone is deficient. All of this contributes to a successful implant placement and restoration.

Additional information concerning the “Triangle of Bone Concept” can be found at Dr. Ganz’s website at www.drganz.com/art2nf1.htm.