

STRAIGHT TALK

3D Imaging

CBCT—changing the face of orthodontics

Drs. Sean Carlson and Juan-Carlos Quintero debut a new column on the added dimension of 3D imaging in the orthodontic practice

While orthodontists are busy changing the faces of our patients, CBCT imaging is changing the face of orthodontics. This imaging method is elevating diagnosis, treatment planning and patient care to previously unattained levels. Because CBCT imaging is a still evolving as an imaging modality for the orthodontic practice, it is important to understand the facts about CBCT, so that the myths can be avoided. For that reason, this column is dedicated to CBCT and its appropriate and effective application in the orthodontic practice.

3D imaging adds the extra dimension that uncovers a wealth of information about our patients. Scans show the teeth and roots, TMJ, the airway, sinuses, root angulations, and otherwise hidden details such as the exact location of supernumerary teeth, root resorption, and impactions. With 3D we can see the teeth in relation to the sinuses, jaw joints and calculate buccal-lingual dimensions of bone. We can take into account the biomechanical aspects of treatment, calculate the directions of movement, and determine anchorage requirements. We can even evaluate



Figure 1A: 2D showing bilateral impacted canines. If one assumes that both are either to the palatal or to the facial, then there is 100% probability of being wrong, resulting in poor iatrogenic damage of the upper right lateral incisor

patients for hidden airway problems, an evolving new area for the orthodontic practice.

As with any technology, some misconceptions have arisen regarding CBCT and radiation exposure. In orthodontics, radiation levels with 2D radiographs can be similar or more to that of a low dose 3D scan. A

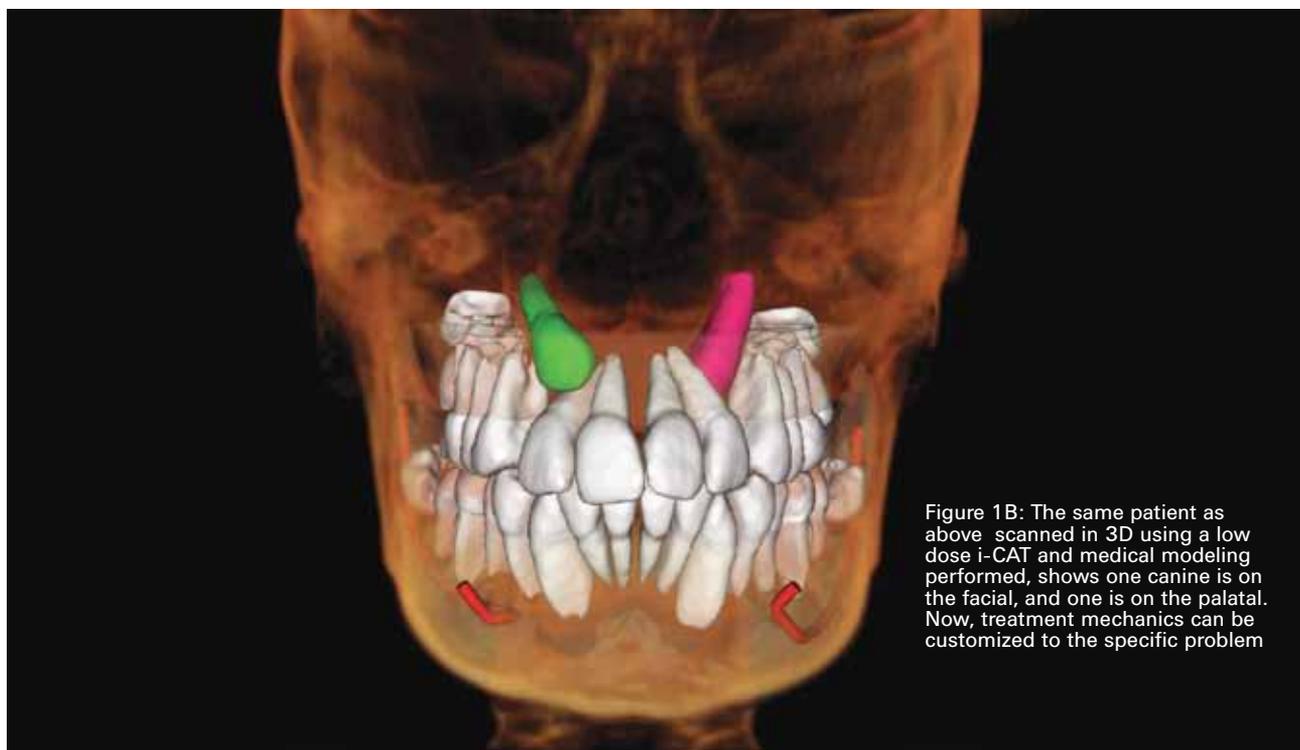


Figure 1B: The same patient as above scanned in 3D using a low dose i-CAT and medical modeling performed, shows one canine is on the facial, and one is on the palatal. Now, treatment mechanics can be customized to the specific problem



Figure 1C: Final result showing successful retraction of the maxillary right impacted canine without iatrogenic damage to the upper right lateral incisor

traditional digital pan, a lateral and frontal ceph, an occlusal radiograph, an FMX or a couple of bitewings and couple of periapicals, can potentially expose the patient to more radiation than taking a low dose CBCT. (More on this in our next column.)

Besides using the scans for more precise diagnosis, CBCT data now continues to contribute to the orthodontic

treatment—as the data can be translated into digital study models and used for CAD/CAM appliance applications, such as SureSmile®. No impressions are needed to create these 3D models. Patients appreciate this (no more gagging!), the process is more accurate, and it saves time for the orthodontist and the patient. Companies can now produce virtual study models that show crowns, roots, developing teeth, impactions, and alveolar bone levels.

Because we want this column to be an interactive experience, we offer you these two images—one in 2D and an i-CAT® 3D scan. How would your diagnosis and treatment plan have been changed if you only had the 2D scan? What insights are gained from the 3D view?

Now that we have offered a brief overview of 3D imaging for the orthodontic office, we look forward to providing more details and innovations in 3D imaging. If you have any questions, please feel free to write to us and we will try to include your answers in future columns. ■

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If you have a question regarding 3D imaging that you want Drs. Carlson and Quintero to address in a future column, please email: 3DImaging@orthopracticeus.com.

For more information on how 3D imaging can improve your practice, please fax this information to (480) 629-4002, visit www.orthopracticeus.com/web/imagingsciences.html to submit this form online, or mail this form to: Orthodontic Practice US | 15720 N. Greenway Hayden Loop #9 | Scottsdale, AZ 85260.

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