

Using 3D Imaging

FOR PLANNING IMPLANT PLACEMENT OF A CONGENITALLY MISSING LATERAL INCISOR

by Anthony LaVacca, DMD, FACP and Manal Ibrahim LaVacca, DDS

Replacing congenitally missing teeth with dental implants can often be a challenging experience for the orthodontist, surgeon, prosthodontist or restorative dentist. In order to achieve a functional and pleasing result, a team approach should be utilized, in conjunction with cone beam 3D imaging to produce optimal aesthetics in the aesthetic zone. This article will discuss several key aspects that should be considered by the whole team in order to provide the patient with a successful result.

A pleasing aesthetic outcome is the ultimate goal in implant-prosthodontic dentistry. Having the roots in ideal position aids in superior implant selection and placement, thereby significantly enhancing the final aesthetics. The patient in this case demonstrates the potential for implant placement complications if 3D imaging and a team approach is not fully utilized to manage implant placement and restoration, especially in the esthetic zone. Included images illustrate how far the patient's dentition has improved since treatment began.



Case Report

A 17-year-old male was referred to us for implant placement of a congenitally missing lateral incisor for his first implant consult after completing ortho treatment. The visual exam demonstrated adequate space for tooth replacement (Fig. 1).

Fig. 2



Fig. 3



However, radiographic evaluation demonstrated inadequate space for dental implant placement (Fig. 2).

Failing to utilize a team approach or not having the adequate diagnostic information from a 3D scan can often increase the potential for a negative outcomes. After evaluation of the root angulation of the canine and central incisor, the orthodontist, Dr. Ibrahim LaVacca was consulted. She realized that a difficult discussion had to occur with the family. She provided and demonstrated to the parents, with the information gained from the i-CAT, about the root angulation.

She then explained the best alternative was to retreat the orthodontics, move the roots to an ideal position, place a dental implant in an ideal position and then restore the lateral.

Needless to say, at the time, the patient's parents were very unhappy but understood the goals and agreed to proceed.

Prior to brace removal the patient was re-evaluated with an i-CAT panoramic radiograph (Fig. 3). We were all happy to report to the parents that the teeth had moved into the correct position and the patient was ready for implant placement.

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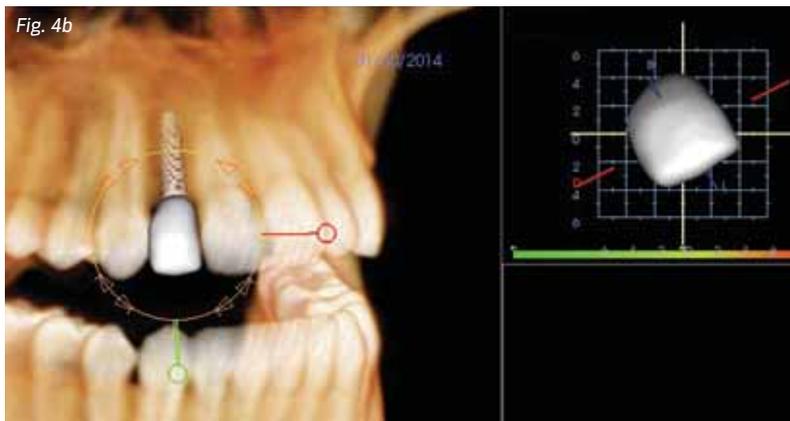
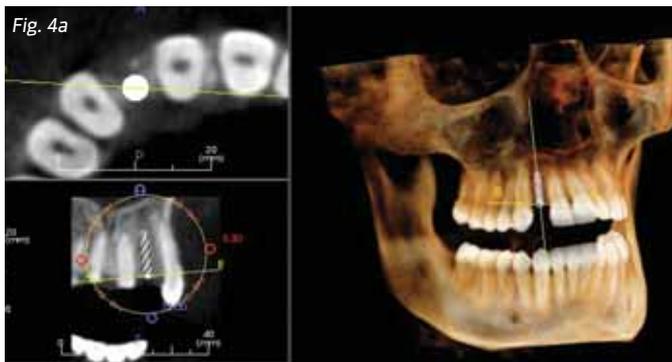


Fig. 4a: 3D implant planning Fig. 4b: 3D restorative planning

Utilizing the 3D scan during our team approach treatment, we obtained exact measurements and detailed information needed to place the appropriate-sized implant—a NobelSpeedy Groovy (Nobel Biocare), 3.5 x 13, in the exact position (Figs. 4a & 4b).

we have begun performing more complex cases in the office, and we know that both the clinicians and the patients appreciate the time saved and the information obtained by having an in-office CBCT unit. I chose the FLX because of its capability for low dose radiation.



We were able to use a standardized temporary abutment and get optimal aesthetics at the time of placement. A temporary abutment was used to support the provisional restoration at the time of surgery. Since we were in the aesthetic zone, the provisional restoration allowed for us to support the papilla and develop a natural emergence profile (Figs. 5 & 6).

The Importance of 3D

Implementing an i-CAT FLX in our multi-specialty dental practice has helped us avoid planning issues arising from the unseen. Traditionally, we sent many of our patients out for CBCT scans to get this additional information, but since we invested in the instrument,

I can take postoperative scans at 6 microsieverts to see if the implant is in the correct position. In fact, with the low-dose setting (Quick-Scan+), I can take a full-dentition 3D scan with a dose comparable to 2D panoramic X-ray.

i-CAT Tx STUDIO software gives me the information and the capability to select the perfect-sized implant for the surgery. I am now able to take my implant procedures to the next level and use guided implant placement to place the implant in the perfect position. The 3D model offers views that are not visible with 2D imaging. On a 2D X-ray, the implant can appear perfectly straight, but in reality be in a buccal undercut, out of the graft material or in minimal bone.

A 3D scan is not only an amazing diagnostic tool, but this extra dimension in imaging also improves communication with the patients. Now, on a 3D model, I can show the patient where the implant will be placed in relation to the position of the roots and other anatomy. This truly builds the patient's confidence and allows me to build a rapport, unlike practitioners who do not have this imaging method. For our multi-specialty practice, i-CAT gives us a great advantage for implants, impacted molars, and orthodontics, and most of all, credibility that we have all of the information to provide superior dental care to our patients. ■

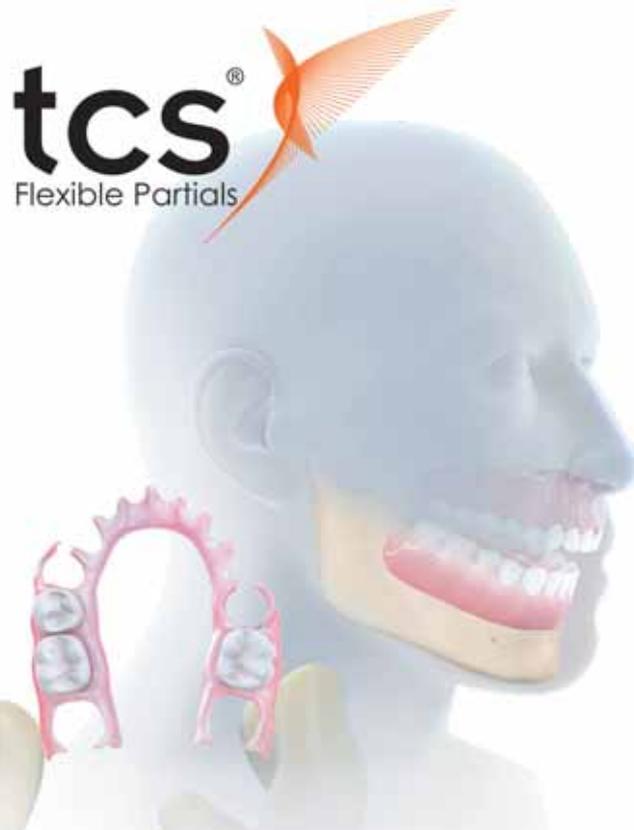
Has the use of 3D technology helped you practice better dentistry? Comment online at Dentaltown.com/magazine.aspx

Authors' Bio

Dr. Anthony LaVacca, an American Board Certified Prosthodontist, received a Doctor of Dental Medicine degree from Temple University. He received post-graduate education in prosthodontics from Montefiore Medical Center/Albert Einstein College of Medicine in Bronx, NY. At the Montefiore Medical Center/Albert Einstein College of Medicine in Bronx, NY, Dr. LaVacca served in several positions, including director of the general practice residency program, interim director of the postgraduate program in prosthodontics, and assistant professor.

Dr. Manal Ibrahim LaVacca is an American Board Certified Orthodontist. She completed her Doctor of Dental Surgery degree at the University of Illinois at Chicago College of Dentistry. She then completed a three year post-doctoral program, and received an advanced certificate in Prosthodontics. After 10 years of private practice in Skokie, IL, Dr. Ibrahim then moved to New York to continue her training in orthodontics. She earned an Orthodontics and Dentofacial Orthopedics certificate from the New York University College of Dentistry.

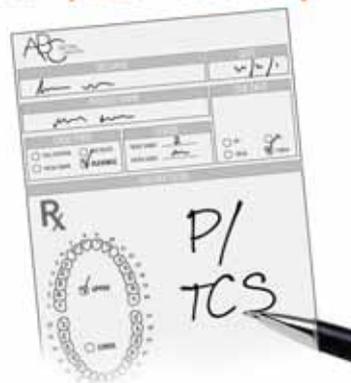
Dr. LaVacca, the owner and founder of Naperville Dental Specialists, and Dr. Ibrahim LaVacca, the owner and founder of Innovative Orthodontic Centers married in 2002 and now reside and practice in Naperville, Illinois.



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