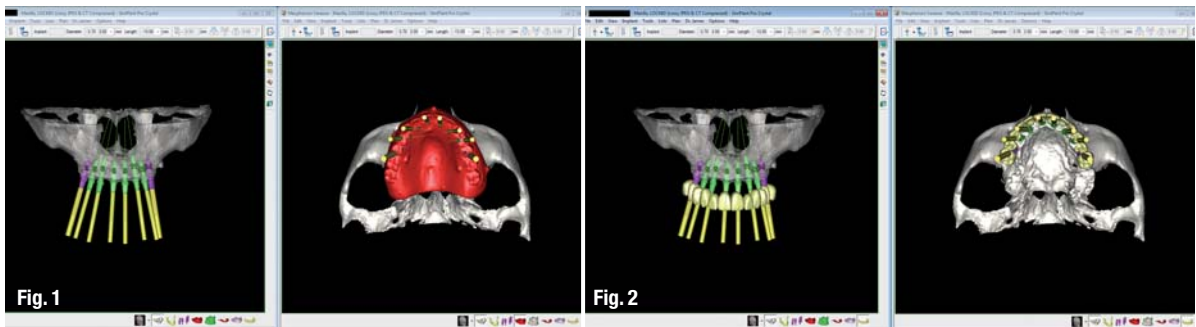


# Immediate restoration in the fully edentulous maxilla region

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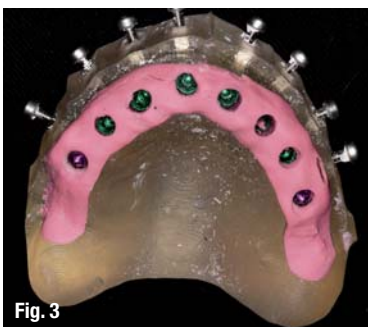
\_This clinical case required optimal implant placement based upon a restoratively driven treatment plan and guided surgery. To achieve this goal, we made use of CT scans, SimPlant planning software (Materialise Dental), the new Zimmer Guided Surgery Instrumentation and the new Immediate Smile model (Materialise Dental). The patient was a 49-year-old white female in good health, completely edentulous in the maxilla and wore a complete upper denture. On the lower jaw, she wore an implant-retained over-denture.

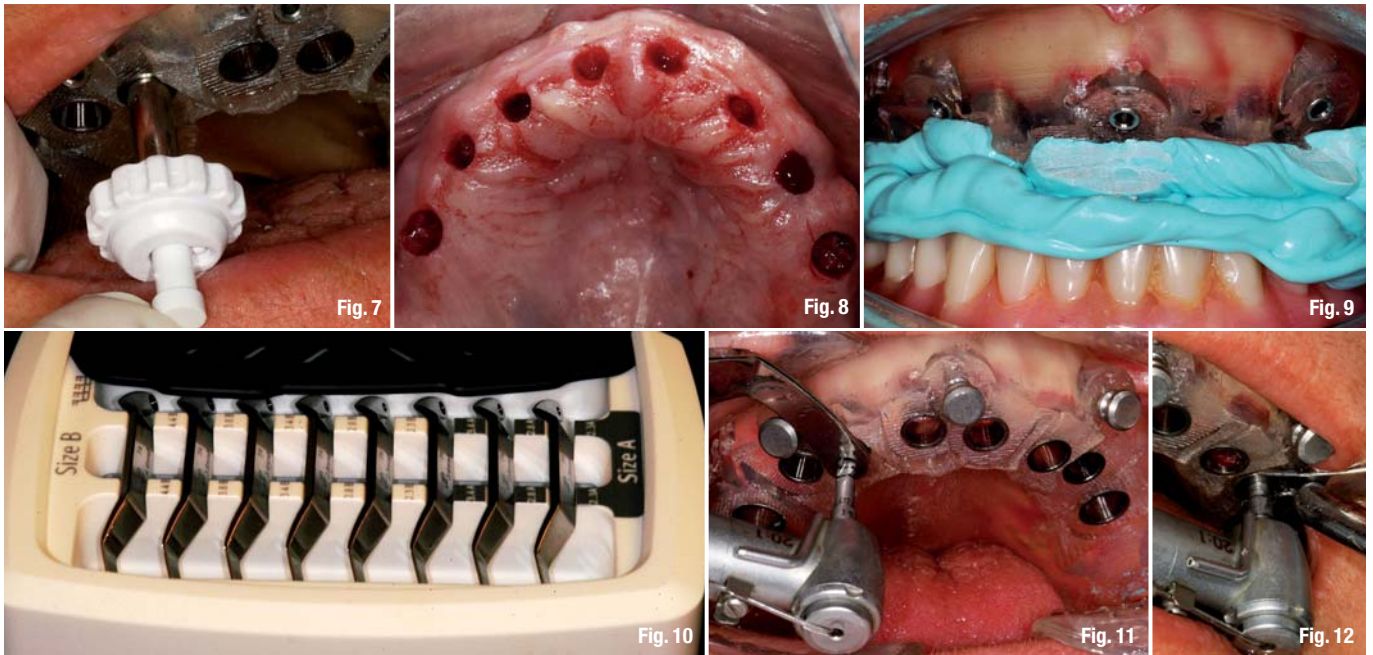
The planning phase for the case began with a CT scan utilizing the i-Cat and the Dual Scan protocol (Materialise Dental). The patient's existing denture was transformed into a scan prosthesis by gluing eight Dual

Scan Markers onto the surface. A radiolucent bite index was made to secure the prosthesis in the correct position.

The patient was first scanned in the i-Cat 17-19 while wearing the conversion prosthesis and the bite index. In a second scan, the conversion prosthesis was scanned alone. The resulting CT data was loaded into SimPlant, and the scan prosthesis was superimposed upon the study using the SimPlant Dual Scan wizard (Fig. 1).

Using SimPlant, the optimum implant positions were determined, based upon available bone with a minimum of 3 mm between implants, and the design of





the final restoration (Fig. 2). The resulting treatment plan was submitted to Materialise Dental for fabrication of a SurgiGuide and an Immediate Smile model.

I received the Immediate Smile model, which contained a duplicate of the scan prosthesis, a bone model with a silicone soft tissue, and a mucosa-supported SurgiGuide. The bone model came with eight openings corresponding to each of the eight implant positions as designed in the SimPlant plan and corresponding exactly in size to the dimensions of Zimmer analogues.

The bone model came with a screw fixation system, which allowed me to recover the analogues. The silicone soft tissue on the model also corresponded to realistic soft tissue. I also received written drilling instructions and a prolongation report detailing the

depth and size of each osteotomy. Zimmer analogues were placed in the Immediate Smile model (Fig. 3). The duplicate of the scan prosthesis was used to mount the bone model with the soft tissue on an articulator (Fig. 4), giving correct orientation and vertical dimension. This made it possible to fabricate a provisional that would be used for immediate loading following implant placement. The mounted model was then used to create an orientation jig for the SurgiGuide (Fig. 5). The jig assured that the SurgiGuide was positioned in the mouth exactly the same way as the scan prosthesis had been positioned in the mouth. This is a very important step for a mucosa-supported SurgiGuide because of the flexibility of the soft tissue (mucosa). Both the duplicate of the prosthesis and SurgiGuide fit perfectly onto the Immediate Smile model, allowing for fabrication of an accurate orientation jig on an articulator.

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The surgical guide was placed in the patient's mouth, and the tissue was punched utilizing a tissue punch (Figs. 6–8). Then, the surgical guide was again oriented in the patient's mouth with the orientation jig created on the articulator and stabilized with three SurgiGuide fixation screws (Fig. 9). Utilizing the Zimmer Guided Surgery Instrumentation and Guided Surgery drills (Fig. 10), all eight osteotomies were created and completed using minimally invasive flapless surgery (Figs. 11 & 12). The Zimmer guide is a SAFE system, accurately providing for depth and size.

The right and left molar (teeth #3 and 14) osteotomies were created short of the maxillary sinus. Then, using the new Sinus Crestal Approach Kit (Zimmer), I extended these two osteotomies into the left and right maxillary sinuses. Alloplastic bone (Puros, Zimmer) was placed into the sinus cavity through the osteotomy and spread using the paddle-shaped spread-

ing bur. Then, all eight implants were placed. Each had initial stability exceeding 35 Ncm. I decided to immediately load only the six implants that did not involve the sinus cavity. Therefore, healing heads were placed on implants #3 and 14, and non-engaging titanium temporary cylinders were placed on #5, 6, 8, 9, 11 and 12 (Fig. 13). The provisional, which the laboratory fabricated, was attached to the titanium cylinders using cold cure acrylic, thus creating a screw-retained provisional (Figs. 14 & 15). A post-operative CT scan showed how accurately the eight implants had been placed in the bone using a mucosa-supported SurgiGuide with orientation jig (made on the Immediate Smile model; Figs. 16–18). The accuracy and success of this case was achieved through CT scanning, SimPlant planning with restorative model overlay, the Zimmer Guided Surgery Instrumentation and the Immediate Smile model. The surgical guide allowed for minimally invasive surgery and greatly reduced surgery time. The Immediate Smile model also reduced chair time by allowing for fabrication of the temporaries well in advance of surgery.

*Acknowledgement*

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