

# A Minimally Invasive Implant-Supported Fixed Bridge Using a Screwless Restorative System

*Michael David Scherer, DMD, MS*

A healthy 45-year-old partially edentulous woman presented with a failing dentition (Figure 1 and Figure 2). After seeing many other dentists who offered extensive surgical options, she presented to the author's dental office with a desire for a minimally invasive implant-supported fixed bridge.

A cone-beam computed tomography (CBCT) scan of the patient was performed (PaX-i3D, Vatech® America, vatechamerica.com), and an intraoral scan (3M™ True Definition Scanner, 3M, 3m.com) was generated of the mandibular arch for diagnostic planning purposes. Using a computerized implant planning software (Blue Sky Plan®, Blue Sky Bio, blueskybio.com), the digital files were merged into a single planning file. Five implants (Tapered Plus, Biohorizons®, biohorizons.com) were planned, and a pilot surgical guide was designed. The guide design file was exported and printed using a 3D printer (Form 2®, Formlabs, formlabs.com) and biocompatible surgical guide material (Dental SG, Formlabs). After printing, the guide was cleaned and metal sleeves (Guide Tubes, Blue Sky Bio) were placed.

After anesthesia, all teeth were extracted, leaving two teeth (Nos. 22 and 27) to help support the surgical guide (Figure 3). The guide was placed onto the mandibular arch, and pilot osteotomies were performed. The guide was then removed, and complete osteotomy preparation was completed using minimally invasive methods. The implants

were all inserted with adequate primary stability in the ideal bone volume position (Figure 4). Abutments were placed (LOCATOR F-Tx® Fixed Attachment System, Zest Dental Solutions, zestdent.com). A radiograph was made to confirm complete seating of the abutments to the implants, and each abutment was torqued according to the manufacturer's recommendations (Figure 5).

Housings (Denture Attachment Housings, Zest Dental Solutions) and block-out spacers (White Block-Out Spacer, Zest Dental Solutions) were applied onto each abutment (Figure 6). The housings were tilted and rotated until all were parallel to compensate for any areas of needed implant angulation due to the patient's bone anatomy. Light-body polyvinyl impression material (CHAIRSIDE® Light Body, Zest Dental Solutions) was injected onto the intaglio of the denture and seated onto the edentulous ridge to mark the position of the denture attachment housings (Figure 7). Adjustments were made inside the intaglio of the denture using a denture attachment adjustment kit (Denture Prep & Polish Kit, Zest Dental Solutions), preparing recesses and vent holes for picking up the housings in the prosthesis. The housings were thoroughly dried; then composite resin (CHAIRSIDE Attachment Processing Material, Zest Dental Solutions) was injected into the prepared recesses, and the prosthesis was seated onto the edentulous ridge. After complete polymerization, the denture and housings were removed from the mouth.



**FIG 1.** A patient presented with a failing dentition and requested a fixed dental implant prosthesis using minimally invasive surgical procedures.

**FIG 2.** The patient's mandibular arch was missing posterior teeth, and remaining teeth were compromised. A CBCT scan was completed to evaluate bone quantity and quality.

With a series of acrylic adjustment and polishing burs (Denture Prep & Polish Kit), the prosthesis was modified to resemble the shape of a well-contoured fixed partial denture. The black processing balls (Processing Balls, Zest Dental Solutions) were removed and medium PEEK retention balls placed into each of the housings. The prosthesis was seated onto the abutments using a posterior to anterior insertion procedure with firm pressure (Figure 8).

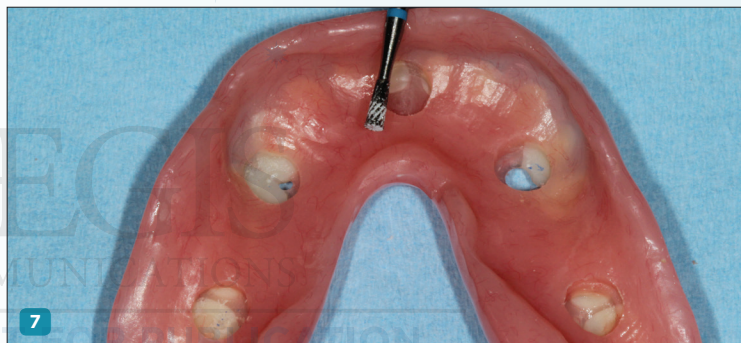
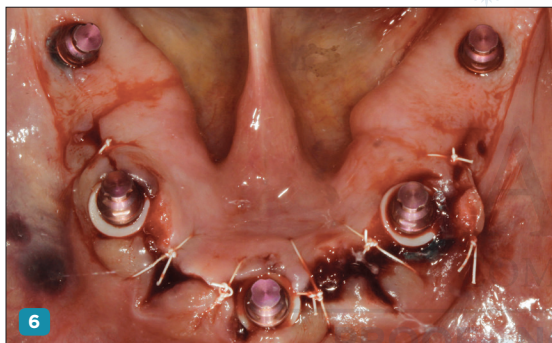
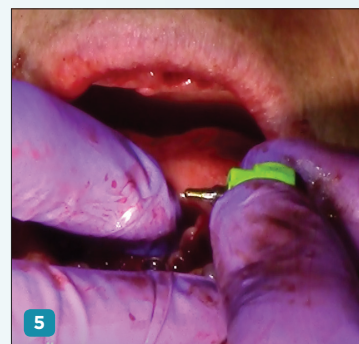
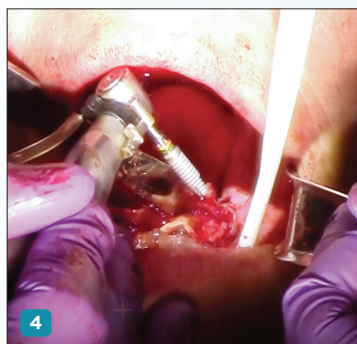
The patient received instructions on how to care for the

new prosthesis and was very satisfied with the esthetics, stability, and minimally invasive surgical procedure.

#### ABOUT THE AUTHOR

##### **Michael David Scherer, MS**

*Assistant Clinical Professor; Loma Linda University, Loma Linda, California; Clinical Instructor, University of Nevada, Las Vegas, Las Vegas, Nevada; Private Practice limited to prosthodontics and implant dentistry, Sonora, California; Fellow, American College of Prosthodontists*



**FIG 3.** The teeth were extracted and a surgical guide was placed to allow minimally invasive osteotomy preparation through the surgical guide. The canine teeth were retained to assist the support of the surgical guide during osteotomy preparation procedures.

**FIG 4.** Implants were placed into the prepared osteotomies, ensuring primary stability of the implants. **FIG 5.** LOCATOR F-Tx abutments were placed onto each implant and torqued. **FIG 6.** Block-out spacers and denture attachment housings were placed onto each abutment, allowing for angulation correction of the implants at the level of the abutment. **FIG 7.** CHAIRSIDE Light Body PVS material was placed into the intaglio of the denture and seated onto the edentulous ridge. Any areas of show-through were adjusted, preparing recesses within the intaglio of the prosthesis. The housings were picked up in the prosthesis using CHAIRSIDE Attachment Processing Material. **FIG 8.** Processing balls were removed and medium PEEK retention balls placed. The prosthesis was placed back onto each implant, ensuring firm seating of the abutments to the housings.