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CASE PRESENTATION

A Digital Workflow for Successful Implant Restoration

Digital impressions enable lab to design and mill abutment and crown based on virtual implant.

A healthy 65-year-old male presented with a 5.8mm x 9mm implant (Tapered Plus, Biohorizons USA) in position in the No. 30 position. Due to the need for a shorter implant because of limited alveolar height above the mandibular nerve canal, an implant was placed with a unique surface (Laser-Lok, Biohorizons USA) to permit optimal bone and soft-tissue healing surrounding the implant. The implant was placed approximately 3 months prior and is stable for restoration.

Compiling Digital Data

Using a .050-inch hex driver, the healing abutment was removed, the implant was air-dried, and a 4.5mm scannable temporary abutment (PEEK Scan Abutment, Biohorizons USA) was placed and finger-tightened until snug. A radiograph was made to verify the adaptation of the abutment to the implant. An intraoral digital impression was made with an intraoral optical scanner (TRIOS 3, 3Shape), capturing the mandibular quadrant from teeth Nos. 25 to 31, including the scannable abutment. Digital impressions of the opposing, maxillary arch and the interocclusal record were also made using the intraoral scanner.

The scan abutment was removed, the implant surface was irrigated with chlorhexidine (Consepsis, Ultradent), and the healing abutment placed onto the implant.

Lab Design and Milling

The digital impression data file was compiled

and sent to a laboratory (Vulcan Custom Dental, Biohorizons USA) for processing. At the laboratory, the scan abutment was digitally extracted from the digital impression data file and a virtual implant placed. The abutment and crown were designed using dental software (Exocad, Exocad gmbh) and sent to a milling machine for processing. A titanium abutment was milled and contoured to provide excellent tissue support, followed by yellow anodization for optical subgingival esthetics. A screw-retained monolithic zirconia crown (Katana, Kuraray Noritake Dental) was milled with the corresponding digital files to seamlessly integrate.

Direct-Hex (Vulcan Custom Dental, Biohorizons USA) 3D-printed models (Dental Model, Formlabs) were printed to verify crown contacts and to facilitate laboratory processing steps. The crown was luted to the abutment in the laboratory (Multilink Automix, Ivoclar Vivadent).

Final Restoration

After receiving the case from the laboratory, the patient returned for delivery of the restorations. The healing abutment was removed, and the one-piece crown and abutment were placed with minimal adjustments needed. The crown was torqued to 30Ncm and a composite restoration (Filtek Supreme Ultra, 3M Oral Care) was placed over the occlusal access channel.

The patient was pleased with the final result and expressed an overall satisfaction with the digital workflow.

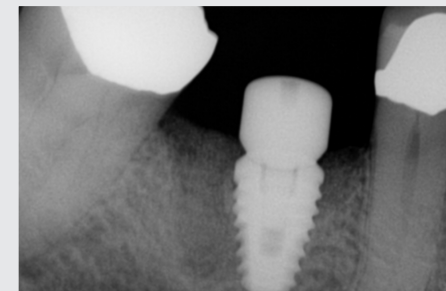


Figure 1—A 5.8mm x 9mm implant (Tapered Plus, Biohorizons USA) was placed with a healing abutment three months prior to restorative procedures.

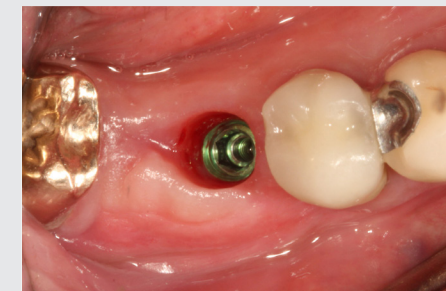


Figure 2—The healing abutment was removed and the implant air-dried.



Figure 3—A scannable temporary abutment (PEEK Scan Abutment, Biohorizons USA) was placed to facilitate an intraoral impression transfer of the implant body.



Figure 4—The scannable abutment has a flat surface that corresponds with the timing of the hex of the implant body. A radiograph was made to verify complete adaptation of the abutment.



Figure 5—A digital impression was performed using TRIOS 3 (3Shape).



Figure 6—The digital impression captured from teeth Nos. 25–31 on the mandibular arch and the corresponding teeth on the maxillary. An interocclusal record was also made to facilitate crown and abutment design.

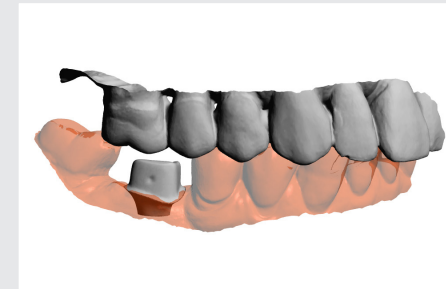


Figure 7—The scannable temporary abutment was digitally extracted at the laboratory (Vulcan Custom Dental, Biohorizons) and an abutment and crown were digitally designed using dental software (Exocad, Exocad gmbh).



Figure 8—A 3D-printed model (Dental Model, Formlabs) was fabricated to facilitate laboratory procedures.



Figure 9—The healing abutment was removed and the final crown was placed and torqued to 30Ncm.

GO-TO PRODUCTS USED IN THIS CASE

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