Screw-Retained Bridges Made Easy with the Latest CAD/CAM Software Technology

Case Presentation

The patient presented with an ill-fitting and discolored full upper denture. The patient had a difficult time eating and socializing due to the denture being not esthetically pleasing or properly secured. He wanted something that would be durable, secured and screwed into place, and a brighter shade. Being very particular, he requested a trial run to test esthetics and function before the final prosthesis.

Treatment Plan

The plan was to place six NobelActive implants and design and create a screw-retained provisional to allow the patient and dentist to test esthetics and function for a period of six weeks. Afterwards, a final zirconia screw-retained bridge would be fabricated for strength with incisal cutback for added esthetics.

Manufacture of Restoration

The physical impressions, bite and photos of the old denture were received from the dentist, the models were constructed, and the case was mounted on a semi-adjustable articulator. A verification jig was created to verify the accuracy of the model. Impression copings were placed on the model and the floss was looped around (Fig. 1). Resin was light-cured over the floss to finish the jig (Fig. 2). A wax set-up was
also created with a temporary abutment on the inside of the posterior section for added stability during the try-in/trial (Fig 3). The jig and set-up were then sent to the prescribing doctor and the model was verified. Set-up esthetics and bite were adjusted chairside and sent back to lab.

Implant parts needed were NT Trading #2 - Connect kits and a driver. The kits consist of a multi-unit abutment, an adhesive cap and a final screw in each package (Fig. 4). A Dentsply Sirona inPost (scanpost) was also needed for scanning the implant positions (Fig. 5).

The models were scanned using the Dentsply Sirona inEos® X5 desktop scanner. The scanning sequence was carried out in the following manner:

1. The bite was scanned in the Buccal Bite catalog.
2. The opposing model was scanned using the reduced mode in the Lower Jaw catalog.
3. The wax set-up was screwed onto the upper model and was then scanned in the Biocopy Upper catalog.
4. The model with soft tissue attached was scanned in the Gingival Mask catalog.
5. The gingival material was then removed from the model and the Scanbody Upper catalog was added. An overview scan was then done of the model and implant replicas. These images were dragged and copied into the Upper Jaw catalog. The “Capture Scanbody” icon was selected and the scanner positioned the model outward for an easy scanpost placement.

Starting with the most posterior implant, the multi-unit abutment was placed onto the model and then the Sirona inPost was screwed on top of it (Fig. 6). The implant positioned was then clicked and the scanbody was scanned using high-definition mode. After this was complete, the inPost and multi-unit abutment were unscrewed and placed on the next implant position to be captured. This process was done for each of the six implants.

Next, the catalogs all automatically stitched together and the digital model was ready to be designed using the new inLab® 16 CAD Software. In the Model phase, the model axis was set and the scanbodies were detected. Next, the gingival margin line was chosen based on the wax set-up. In the Design phase, the proper Morphology was chosen for the anterior segment. The inLab software allows for easy design using the Biojaw function. This jaw-
oriented Biogeneric setting uses patient-specific positioning of the teeth to allow rapid design with minimal corrections needed.

The Harmonic setting was chosen and all teeth were easily linked, positioned and scaled into proper position using the BioCopy model of the scanned wax set-up as a guide. In addition, the unadapted proposal was used, keeping the teeth directly where they were positioned in the previous step. Screw channels were automatically calculated and the design of the restorations were now adjusted using the many tools available.

The gingiva design element was also able to be adjusted to the patient's needs (Fig. 7). After the design was complete, the bridge was exported to inLab® 16 CAM (Fig. 8). In CAM, Harvest ZCAD™ Temp Esthetic™ 20 mm was chosen and milled using the inLab® MC X5 milling unit. Sprue tapering was selected for easy removal after the milling was complete (Fig. 9). GC OPTIGLAZE™ was also added for esthetics.

#2 - Connect adhesive caps were cemented into the provisional and the abutments, screws, and bridge were sent to the prescribing dentist. The patient wore the screw-retained provisional for six weeks. After the trial period was complete, the case was sent back with a prescription of the necessary esthetic and occlusal corrections to be performed. The case design was adjusted to the patient's needs and exported to CAM.
Sprue tapering was selected and a sinter support was automatically proposed (Fig. 10). The zirconia was milled using the inLab MC X5 milling unit in a 25 mm Cercon Ht Zirconia disc (Fig. 11). After milling, the bridge was contoured and facials were cut back in the green state so they could be layered. Zirconia was now infiltrated to add additional coloring and effects using White Peaks coloring liquid from Empire Dental (Fig. 12).

The bridge was sintered overnight in the Dentsply Sirona inFire® sintering oven. After baking, the sinter support was cut off (Fig. 13). The bridge was then glazed and colored with GC Lustre Paste and the pink gingiva was enhanced using GC Lustre Paste Gum stains (Fig. 14). IPS e.max® Ceram was then layered on the facials of 6-11 and IPS e.max Ceram Gingiva was layered on the gingiva (Fig. 15). The ceramic was then contoured,

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polished and glazed. Adhesive caps were cemented (Fig. 16) into the prosthesis and sent to the clinician for seating (Fig 17).

Conclusion

The patient was extremely happy with his new smile. JDT

About the Author

Jay Black, CDT, is a graduate of the University of Florida and is co-owner the Winter Springs Dental Laboratory in Winter Springs Fla. Not only he is a dedicated member of the Sirona beta testers for new CAD/CAM technology, he is also one of the advanced trainers for Sirona inLab and Patterson Dental. As an inLab beta tester Jay participates in future developments on the world’s most advanced CAD/CAM system. As a Certified Dental Technician he has earned a reputation for exceptional quality and service. His laboratory is focused on difficult cases, custom abutments, and implant technology. He is also one of the moderators of Cerecondemand.com and Director of the East Coast CEREConDemand Education Center.