Efficiency, esthetics aided by technology

Technological advances assist laboratory technicians as shown in this screw-retained full zirconia restoration.

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As everyone in the dental industry knows, technology is moving at a rapid pace and helping dental technicians work faster as well. We were not able to fabricate restorations as quickly or accurately in the past but we have greatly surpassed what we used to be able to do with the invention of CAD/CAM and other technologically advanced equipment. The case study in this article will illustrate a screw-retained full zirconia restoration and our attempt to match the custom color while using a milling machine. This is an efficient and effective method which betters our production line by giving our dentists an economical solution to their restoration questions.

THE CASE

01 A Nobel Biocare implant was placed in the model without soft tissue (Fig. 1). This was in preparation for the scanning design.

Fig. 1 Nobel Biocare implant was placed in the model
Fig. 2 MAP 400 scanner
Fig. 3 AmannGirrbach ceramill motion 2 milling machine

Fig. 4 Underside view of the implant coping
Fig. 5 One piece full contour coping
Fig. 6 Coping was pre-shaded

Fig. 7 Mirrored image
Fig. 8 GC Lustre Paste application
Fig. 9 Enamel color incisal 1/3
Using the MAP 400 scanning system, the model was placed in the scanner and the design compared to the adjacent teeth (Fig. 2). The goal with the design was to create broad, wide contact.

After the scan was completed, the model was moved over to the AmannGirrbach ceramill motion 2 milling machine for milling (Fig. 3). An underside view of the implant coping follows (Fig. 4). After removal, the one-piece, full contour coping was smoothed over in the connection area (Fig. 5). Before sintering, the coping was pre-shaded (Fig. 6) for two minutes in the AmannGirrbach stain. A large variety of shades are offered for this process in order to provide a correct match in the mouth. After staining, the coping was dried for 30 minutes at 80°C. It was then placed in the sintering oven.

The mirrored image of the implant coping demonstrates its appearance in the next stage (Fig. 7). For the implant to be completely integrated, it is necessary to use a metal primer on the titanium and zirconia areas and let it dry before continuing (Fig. 10).

To cement the abutment to the crown, the technician used G-Cem cement (Fig. 11). This process was completed (Fig. 12) before moving forward. Next, the technician light cured the restoration for 20 seconds in all four of the exposed areas (Fig. 13).

Immediately after cementation, the dentist flossed the area to remove any excess material (Fig. 14). The final shot follows (Fig. 15).

**Closing Thought**

We have several options for implants: with screw–retained (one-piece) or cement–retained (two pieces) being two of those possibilities. In the past, we had to use titanium and PFM or a UCLA abutment for a screw-retained implant crown. This created extra effort for the wax/metal technician and required more time to work with the metal and then apply the porcelain. With this new method of fabricating restorations, we have eliminated the extra steps, with a metal-free material as the final prosthesis. This alternative option is time and money saving for the clinician, the patient and the lab.

**About the Author**

An accomplished dental technician with more than 20 years of experience, Luke S. Kahng, CDT, is the founder and owner of LSK121 Oral Prosthetics, a dental laboratory in Naperville, IL. He has published more than 80 articles in dental journals, and his lectures have taken him across the United States and internationally. He is the creator of the Chair Side Shade Guide Seasons of Life, 3.0, 4.0, 5.0, 6.0 and 7.0 ceramic shade tabs, which were invented to facilitate effective communication regarding color between doctors, patients and technicians.