How to Create the Best Esthetics Using Modern Digital Technology

Using milled titanium to make a great restoration.

New methods of utilizing CAD/CAM digital dental technology are growing every day. In the future, this approach will be the more common when we are fabricating restorations for our clients. It has certainly changed the way our laboratory industry operates. We can produce restorations at a more predictable level with less cost than we were able to in the past and as an added bonus—the product is better! It is another option available to us and, many say, the wave of the future.

CASE STUDY

Our patient presented with four screw retained implants placed in the mandibular area (Fig. 1) for the purpose of placing a PFM bridge. The abutments used previously

- Fig. 1 Multi-unit implants
- Fig. 2 Check bite record
- Fig. 3 Check occlusion and access holes' insertion direction
- Fig. 4 Freedom Scanner
- Fig. 5 Nesting stage
- Fig. 6 Milled titanium substructure
- Fig. 7 Opaqued titanium substructure
- Fig. 8 GC Initial Titanium Porcelain
- Figs 9, 10 Try on model for occlusion and fit check

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were UCLA, which had involved ordering, modifying, waxing up and the use of gold and casting—time consuming and expensive, especially when the metal weight is high.

02 So that the doctor would not have to pay a high gold price, the lab suggested that the one piece bridge be fabricated using titanium, milled in-house at a less costly rate. He agreed.

03 The bite record was placed on the model next for a proper measurement (Fig. 2). In (Fig. 3) the screw-retained occlusion was checked, as were the access holes in order to make sure everything was properly placed and that the access holes insertion direction was correct.

04 Figure 4 is an image of a Freedom scanner from DOF, which was utilized in the scanning process of this case. The model was placed entirely inside with a semi-adjustable articulator. Using this scanner, the technician is able to scan any semi-adjustable articulator for proper occlusion and bite.

05 The next stage in the process was the nesting stage, after design, (Fig. 5) in order to maximize disc space. During this stage, the structure’s set-up position is determined according to the thickness of the titanium disc. Our milled titanium substructure was next photographed inside the machine (Fig. 6).

06 The titanium bridge was then opaqued (Fig. 7) after cutting the sprue and finishing the metal framework. The framework was not de-gassed because that step is unnecessary; however, titanium bonder was applied and then the restoration baked. Two or three times, the opaque was applied and the substructure was baked after each application before moving onto the next stage.

07 After opaque, the dentin application was layered on, using GC Initial Titanium Porcelain (Fig. 8). It was then tried on the model for an occlusion (Fig. 9) and fit check (Fig. 10). Mirrored views of the porcelain to titanium with pink porcelain tissue are next (Figs 11, 12 and 13).

08 Figure 14 shows a final view of the mirrored restoration, ready to be delivered to the client.

CONCLUSION

Many people are concerned about porcelain-fused-to-titanium restorations, especially with regard to cracking or de-bonding. With the old technique dental technicians used that involved casting, that concern was often a legitimate one. That method was not trustworthy. However, in using CAD/CAM and milling our titanium hybrid bars, no casting is involved. Without the extra steps or oxygen/gas involvement, we do not experience those issues. The specific bonder we use for titanium assures us of a successful outcome with our work.

ABOUT THE AUTHOR

Luke S. Kahng is an accomplished lab technicians, specializing in high-end ceramic restorations. Luke has served on several major dental journal boards as a contributing member. Luke invented the Chairside Shade Guide—Volumes 1 and 2 and then expanded the offering to a unique ceramic shade guide system named the Seasons of Life Selection. Luke is owner and President of his own lab, LSK121 Oral Prosthetics, one of the largest dental laboratories in the country, located in Naperville, IL. He has published over 100 articles in major national dental publications, along with several books.