

Designing SOLUTIONS

by Luke S. Kahng, CDT

One of the most difficult challenges facing the restorative dentistry arena is having the ability to solve issues involving less than ideal circumstances. The case presented is a representation of this type of dilemma.

Case Report

The patient, who was in need of prosthetics involving four anterior units mandibular, along with a single unit (lateral) on the maxilla, had three BioHorizon 3.0 implants surgically placed in positions #23, #26 and #7. Impressions were forwarded to LSK121 for case fabrication. During case planning, the decision was made to fabricate a UCLA abutment. (A zirconia abutment had been considered, but due to the difficulty of having it produced, our choice to wax and cast in precious yellow gold was solidified.) The material chosen for the final restoration of this four-unit cement retained bridge was zirconia. This was due, in part, to its superior

masking qualities, eliminating the need for use of opaque on the abutment. As the plans began to materialize, the determination was made that alterations would have to be made in regards to the abutment design. This issue was directly correlated to the size of the implants placed mandibular in relation to the amount of room needed to achieve case expectations.

In figure 1, we see the pre-operative diagnosis view. Notice that #7 heeling cap is not subgingival. We would be on alert as we proceeded through the process of planning so that the highest aesthetics would be achieved. We then proceeded with the custom shade matching (Fig. 2). Generally, premolar dentition encompasses more opacity and fewer translucencies. The Seasons of Life custom ceramic shade tab, IT2 and IT3, provided an excellent representation of the adjacent regions to #22 and #25. Shade matching on the maxillary showed #6 and #8 have opacity at the B3 zone with about 30 percent overlay of enamel and translucency (Fig. 3). After



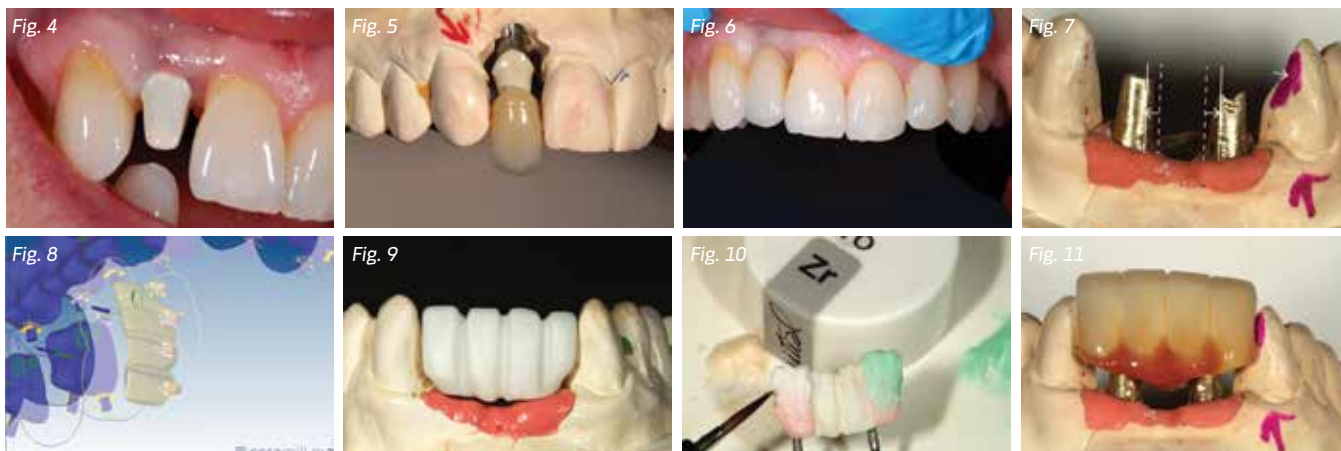
Fig. 1: Pre-operative diagnosis view.



Fig. 2: Custom shade matching in the mandibular area.



Fig. 3: 30 percent overlay of enamel and translucency.



*Fig. 4: UCLA abutment was torqued down into the mouth.
 Fig. 5: Finished zirconia restoration ready for try in.
 Fig. 6: The harmony of the restoration.
 Fig. 7: Notice the lack of room due to the width of the abutments.
 Fig. 8: The restoration was designed with the Amann Girrbaach map 400.
 Fig. 9: After sintering, the understructure was returned to the model.
 Fig. 10: B3 to replicate the natural dentition; enamel opal 4 with T0; along with enamel 59.
 Fig. 11: After glazing.*

the preliminary review was complete, we fabricated the UCLA abutment and it was torqued down into the mouth (Fig. 4). Notice the opaque overlay on the abutment. This will aid in the final restoration shade match in preventing any grey undertones (Fig. 5). Shown on the cast model is the torqued down abutment as well as the finished zirconia restoration ready for try in.

Upon seating in the mouth, the harmony of the restoration in relation to the adjacent teeth can be immediately observed. Tissue will resume to its proper gingival health within a couple of weeks to provide a beautiful, natural, closed margin.

In figure 7, we see two gold UCLA abutments in the model. Notice the lack of room due to the width of the abutments. This presented some concerns in fulfilling a four-unit bridge request. If standard protocol was followed in this case, the resulting restoration would have proven to be unnaturally asymmetrical and highly unaesthetic. This is where the critical thought process of an experienced technician can make all the difference. They must look at all aspects of the frame design from proper abutment selection to the overall design, making sure that it will engage with the tissue while providing good support. Close attention must be paid to the path of insertion and interproximal contacts. To achieve the space necessary and obtain outstanding results in this case, reductions were made to the mesial of #22 abutment as well as the mesial of #25 abutment. This enabled the space crucial to completing the bridge.

After the UCLA gold abutments were modified, the model was scanned and the restoration was designed with the Amann Girrbaach map 400 (Fig. 8). It then was milled using the Ceramill Motion 2. After sintering, the understructure was returned to the model (Fig. 9). The margin area is designed to allow for pink porcelain. We then applied the appropriate materials to build up the shade (Fig. 10). Shown are B3 to replicate the natural dentition; enamel opal 4 with T0; along with enamel 59. Figure 11 shows

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Fig. 12: The modified abutments seated in patient's mouth.

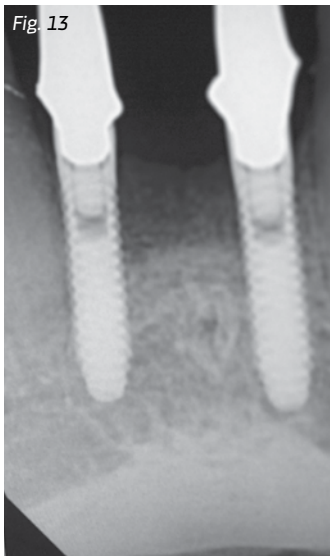


Fig. 13: Proper engagement of the seated abutment.



Fig. 14: A verification jig was constructed to establish accuracy.



Fig. 15: The final restoration placed.



Fig. 16: The final smile is revealed showing the highly aesthetic.

the final restoration after glazing and figure 12 is a review of the modified abutments seated in patient's mouth. An X-ray is taken to ensure proper engagement of the seated abutment (Fig. 13). Also note that a verification jig was constructed to establish accuracy (Fig. 14). Figure 15 shows the final restoration placed with the mouth retracted for the post operative view. The final smile is revealed showing the highly aesthetic outcome ingenuity allowed us to achieve.

Conclusion

In order to obtain a beautiful result, it is important, as a technician, to assess all elements involved in executing the best product for the patient. In this case, special consideration was taken with

the frame design of this cement-retained prosthesis. This, coupled with abutment design modifications, proved critical to the overall success in high aesthetics. This required a highly knowledgeable, skilled technician with a wealth of experience to really think outside the box and solve the issue. In today's dental laboratory we see more and more CAD/CAM-generated restorations with a lot of these technicians being brought in with a different type of skill set. This has a definite place in the dental laboratory but unfortunately, as witnessed here, not every case that crosses our paths is standard, non-complex and straight forward. This is when experience in restorative artistry can make even the most seemingly hopeless case into a masterpiece. ■

Comments or questions on this case? Visit Dentaltown.com/magazine.aspx.

Author's Bio



Luke S. Kahng is one of the world's finest and most accomplished lab technicians, specializing in high-end ceramic restorations. As an active contributor to the dental community, he has also held positions on several major dental journal boards, and is frequently a keynote speaker at numerous conventions, labs or his own lab-hosted seminars.

As the owner and President of LSK121 Oral Prosthetics, Kahng has developed his lab into a high-profile entity. Located in Naperville, Illinois, LSK121 provides oral restorative services and assistance transnationally.

More than 100 articles written by Luke have been featured in major national dental publications. His authorship has also made its way into the publication of several books, and resources for the advancing knowledge of the dental community. His titles include *Anatomy from Nature*, *The Aesthetic Guide Book*, *Smile Selection Plus CS3 Clinical Cases*, *The Kaleidoscope Wax-Up Book* and his latest hardcover, *Replicating Naturalism: Tooth Design*.