

ESTHETIC MONOLITHIC RESTORATIONS AND A MODEL-FREE WORKFLOW

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While monolithic restorations are perhaps simpler for labs to produce than layered restorations, they demand much more from the material the lab and dentist choose for the case. When monolithic restorations are completed without a model, the performance of the material must be even greater. As these factors highlight, attempting a model-less workflow is not a decision that a lab should take lightly. Not only does this process call for a reliable and esthetic material, but also a highly skilled technician, excellent software and an outstanding mill. If any one of these factors is not present, the results may be compromised.

The author has been creating model-less crowns occasionally over the past year utilizing 3M™ ESPET™ Lava™ Plus High Translucency Zirconia. While the cases selected for the model-less procedure have typically been single-unit posterior crowns, the author recently completed a four-unit monolithic crown case using this workflow, which resulted in all of the crowns being seated with no adjustments.

A Precise Workflow

The level of precision required to result in no adjustments during the seating process is made possible by several factors. First, the digital impression captured in the dentist's office gave the laboratory highly accurate data to serve as the foundation for the remainder of the case. The laboratory



Compared to other zirconias, the patented formula of Lava Plus zirconia system provides significantly higher translucency, without compromising strength.

software, Exocad, was then able to import the file directly for use in designing the four crowns. The anatomical libraries in this software provide tools that allow for a simple and efficient process to design extremely lifelike crowns. Once the crowns were designed, the combination of a Lava mill and Lava Plus zirconia contributed to a remarkably precise final product.

Because unsintered Lava Plus zirconia is approximately 20 percent larger than the final result, the lab is able to use burs that are smaller in diameter to create truly precise anatomy. After sintering, the final results are very lifelike. Achieving this level of precision in the anatomy is simply not possible when milling on a 1:1 basis, as is done with lithium disilicate. Additionally, labs that work with less precise milling systems often have to add secondary anatomy after milling because their mill cannot necessarily reach the level of detail that a Lava mill is capable of. With this combination of tools, however, all of the final anatomy can be developed virtually and simply milled.

A High-Performance Zirconia

While there are numerous zirconia materials on the market that might have been utilized for such a case, it's important to consider a material's shade-matching potential for cases that demand an esthetic monolithic material. This Lava Plus zirconia is more translucent than the traditional Lava zirconia, which is made possible by a lower alumina content. High quality processing is also used to optimize the material and avoid impurities and structural defects. Most importantly for esthetics, the material has 18 dyeing liquids that cover the 16 VITA classical A1-D4 shades, in addition to two bleach shades.

Lab technicians who have worked with a variety of zirconia materials know that each has a different shading system, and most

of them are fairly inaccurate. This is due to the fact that manufacturers often try to generalize the shading by achieving four or five shades within one shading liquid. The result of this approach is typically a restoration that is in the neighborhood of the desired outcome, but not as close a match as can be achieved with a multitude of different, distinct shades. In the case shown here, additional shading customization was completed after using traditional staining and glazing techniques, resulting in very natural-looking crowns that blended in seamlessly with the patient's existing teeth.

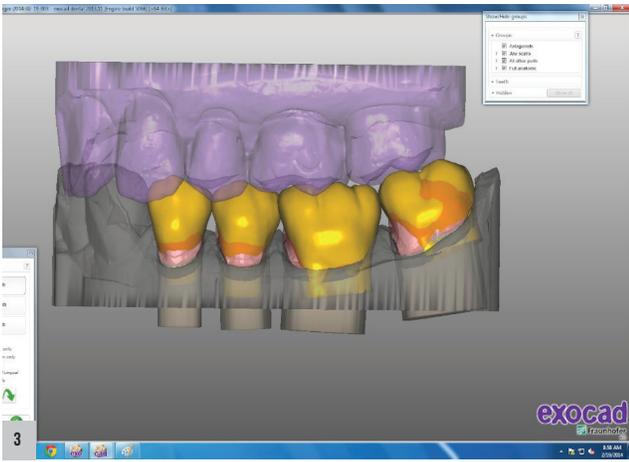
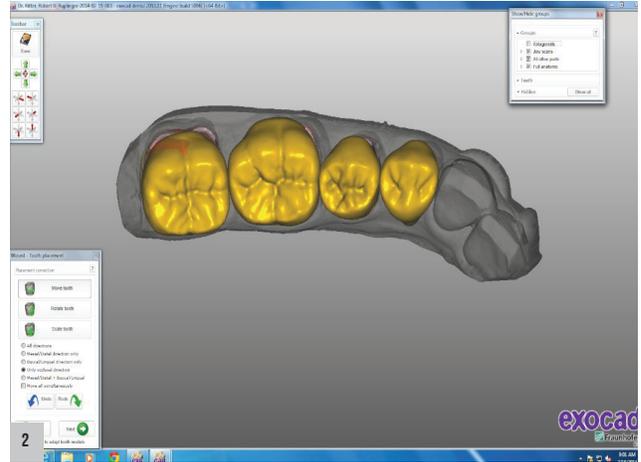
One final consideration for a posterior crown material is of course strength. The high strength of this material allows dentists to create preps that preserve tooth structure, and data shows that the zirconia is not abraded or roughened under occlusal load.

An Ideal Combination

The restorations in this case were seated uneventfully, an exciting but not surprising outcome for this model-free workflow. While it may seem bold to leap from single-unit crowns to a four-unit case with this workflow, the excellent accuracy of the crowns that had been previously produced by the author and the dentist gave both confidence in this attempt.

As outlined here, the success of such a case depends on the combination of tools and skills used. The lab must utilize an esthetic and strong material, and it must have an excellent CAD system that matches up with an excellent CAM system. While one weak link in this combination might prevent a successful outcome, the result shown here is an excellent illustration of what is possible when superior tools are combined. ■

Clinical images provided by Dr. Robert Ritter of Ritter & Ramsey General and Cosmetic Dentistry



Bob Williams, CDT, is the Owner of Synergy Ceramics, one of only 10 VITA® Masterlabs™ in the U.S., and Techsource Dental, an authorized Lava Milling Center and Atlantis Custom Abutment specialist. A senior member of Claude Sieber's "art & experience" and the AACD, and currently becoming a recognized specialist at The Kois Center, Williams lectures internationally on patient-specific abutments, implants, porcelain and indirect composites.

Fig. 1: A model-less workflow was used to create crowns for Nos. 18-21. **Fig. 2:** The Exocad software enabled precise design of the anatomy. **Fig. 3:** The occlusion and contacts were adjusted. **Fig. 4:** The completed Lava Plus zirconia crowns. **Fig. 5:** Final result.