

# FOCUS ON: Implant Bridges

*Michael Tischler, DDS, discusses the positive attributes of the full-arch, zirconia, CAD/CAM, screw-retained implant bridge option.*

**Q:** What are the clinical advantages of a zirconia screw-retained implant bridge?

**A:** There are 6 options to replace a full arch of teeth supported by dental implants: an overdenture, a cement-retained PFM implant bridge, a cement-retained zirconia bridge, an acrylic screw-retained implant bridge, a screw-retained PFM bridge, and a zirconia screw-retained implant bridge. Only the screw-retained zirconia bridge option offers over all: retrievability, low susceptibility to chipping and staining, low plaque attraction, no casting distortion, and ideal aesthetics that includes the teeth and a predictable smile-line interface.

Basically, every shortcoming of alternative implant supported options is answered by the zirconia, screw-retained, CAD/CAM bridge. For example, the effects of hybrid bridges have burdened clinicians for many years with the chipping, staining, wearing, and causing plaque attraction at the gingival/implant interface; these are now problems of the past with this zirconia screw-retained option.

**Q:** How is this zirconia bridge created?

**A:** Zirconia screw-retained implant bridges are CAD/CAM designed and milled from a block of yttrium-stabilized zirconia (YTZ zirconia). Once a bridge design has been created, the YTZ zirconia is milled in a presintered "green state" that is relatively soft. This green state milled bridge is 20% larger than the final bridge. It is when the bridge is in this softened pre-sintered state that stains are added for aesthetics and detail slapping is done. After this green state bridge is sintered for approximately 11 hours, the zirconia shrinks 20% in a very predictable and accurate manner. This hardened (sintered) zirconia is now around 1,100 psi, which is twice as strong as other comparable ceramic options. Porcelain is then added to the gingival areas, and can also be added to the facial areas of the teeth as an option. The teeth surfaces can be left alone as full contour zirconia. The fact that the bridge is CAD/CAM milled, and not cast, eliminates the casting errors and distortion issues that were previous fabrication challenges for many years.

**Q:** Can overdentures and hybrid bridges be converted to zirconia screw-retained bridges?

**A:** The answer is yes. The previous acrylic prosthesis can actually be used to guide the creation of the zirconia screw-retained bridge with regards to the prosthetic parameters. A clinician can use a denture duplicator or similar technique to allow the laboratory team to have a copy of the previous prosthesis. From the duplicate prosthesis, the laboratory team can use that for information to



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create the new zirconia screw-retained bridge. It must be taken into consideration that 12.0 mm of prosthetic space is needed for zirconia bridge success. Another consideration is the amount of cantilever distally. We try to treatment plan for a one-tooth cantilever in our practice. We feel this is better from a structural and biomechanical implant stress standpoint. Depending on the anterior/posterior spread of a patient's arch, this may at times only allow first molar occlusion. Once patients understand that they will be able to smile and chew adequately they are fine with it. The alternative is to place more implants distally, which usually requires bone grafting.

**Q:** Are there specific surgical steps needed for zirconia implant bridge success?

**A:** As with any implant screw-retained prosthesis, the location of the screw hole access is important, especially in the anterior region. If screw holes are directed toward the facial of an anterior tooth, then they should be redirected with multi-unit, angle-corrected abutments. To avoid this, proper planning and placement with a CT scan (with or without guides) must be done. Another surgical consideration is to make sure there is adequate alveoplasty when implants are placed. Once again, a CT scan will allow for proper bone reduction, to allow

for 12.0 mm of prosthetic space. The last surgical consideration is tissue reduction. Tissue must be reduced or manipulated so that the implants are not too far subgingival while allowing abundant keratinized tissue around them. In our practice, we generally place 6 implants between the sinuses in the maxilla and 5 implants between the foramen in the mandible. This can be done with the all-on-4 technique, but there has to be an adequate anterior/posterior spread of the implants.

**Q:** Are there specific prosthetic steps needed?

**A:** The entire final zirconia screw-retained implant bridge is created based on wax setups and wax rims, in accordance with basic prosthetic principles. Once the prosthetic parameters are ascertained, the final prosthesis is then CAD/CAM designed and milled. A verification jig is created and verified and then a screw-retained provisional is created to test the prosthetic parameters before the final bridge is milled. An accurate, open-tray impression is utilized to create an accurate working model. These protocols are similar to what most dentists were taught in dental school and are already doing.

**Q:** Where did the zirconia implant bridge originate?

**A:** The first company worldwide to create zirconia screw-retained implant bridges was Zirkonzahn, located in the Prettau region of Italy. They started with a manual copy mill, and it has evolved to a state-of-the-art, 5-axis milling process. Zirkonzahn is the only company in the world to have an entire system to create a zirconia screw-retained bridge. This system consists of milling machines, specific scanners, sintering ovens, stains, porcelains, and more. This system has been used for many years in Europe and the United States. In my opinion, it is important to use a time-tested product, especially when a full arch is being restored.

**Dr. Tischler** has a general private practice in Woodstock, NY. He is a Diplomate of the American Board of Oral Implantology, a Diplomate and Fellow of the International Congress of Oral Implantologists, a Fellow of the American Academy of Implant Dentistry, and a Fellow and graduate of the Misch International Institute. He is on the continuing education editorial board for *Dentistry Today* and on the editorial advisory board for the *Journal of Implant and Advanced Clinical Dentistry*. He has published many articles in various dental journals and lectures internationally on the principles of implant dentistry and bone grafting. He is the director of the dental implant department for Tischler Dental Laboratory and is also on the BioHorizons educational speakers' panel. He offers in-office courses at his teaching facility in Woodstock many times during the year and has a popular instructional DVD available that covers the principles of implant dentistry and bone grafting. He can be reached at (845) 679-3706 or via the Web site [tischlerdental.com](http://tischlerdental.com).

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