

Triceram on Titanium: A New Frontier in Restorative Dentistry

Les Rykiss, DMD and Bassam Haddad, CDT

A healthy 44-year-old female with 30-year-old PBM crowns teeth 11 and 21. These crowns are definitely long overdue for replacement. Both crowns have clinically visible leaking margins and gingival recession (Fig. 1). The patient requests a more youthful looking smile and it was determined that the best way to achieve this with minimal effort was to simply update her two crowns. At her pre-op appointment, study models and a full set of clinical photos were taken.

PROCEDURE

Radiographs show that no pathology was present, and as long as the existing posts were still useful, there would only be the need

to remove the crowns, replace the cores and get rid of any sign of caries prior to re-prepping the teeth. Given the open margins present, there was some concern that there would be a fair amount of caries present under the old crowns.

Prior to the teeth becoming desiccated, we selected the preliminary working shade with the Vita easy shade, and then took a series of photos from different angles with the appropriate shade tabs to get a good baseline, so that we could be able to convey to our Master technician, Mr Bassam Haddad of Vivaclair Canada dental laboratory in Montreal, Quebec (www.vivaclair.ca), what the true shade of her natural teeth is.

Having heard about a technology that allows bonding ceramic for zirconium oxide and titanium, I asked Bassam Haddad my master technician at Vivaclair Canada dental laboratory who suggested the use of Triceram Ceramics from Dentaaurum (Dentaaurum Canada) over titanium.

Triceram is a technology that uses ceramic bonded on Titanium. The advantages are bio compatibility with the human body, a neutral metal which prevents the patient from experiencing a metallic taste as can be the case with other dental alloys. Another big advantage is that titanium is four times lighter than gold which is very noticeable in



FIGURE 1



FIGURE 2

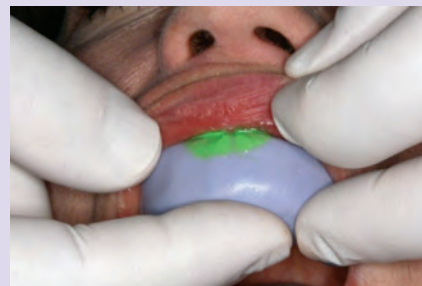


FIGURE 3

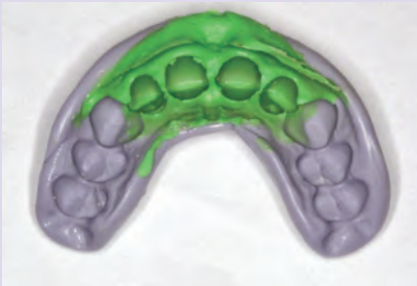


FIGURE 4



FIGURE 5



FIGURE 6



FIGURE 7



FIGURE 8



FIGURE 9



FIGURE 10



FIGURE 11A



FIGURE 11B

large bridge work while keeping a high strength value.

When working with a lab in a different city, it is imperative to give the technician as many true light photos so that they can see the different nuances of each tooth in the smile zone as well as to be able to make the new crowns blend in and look as lifelike as possible. Once we were comfortable with the shade selection, the patient was anaesthetized. A VPS stent was made intraorally

to be able to fabricate provisional crowns (Integrity, Dentsply) for her (Figs. 3 & 4).

This stent would be used for the initial fabrication and then intraoral modifications would be done to try to mimic the shapes and contours of what we would like the final crowns to look like. These photos were also sent to the lab.

The final step prior to removing the crowns was to take an ac-

curate face-bow record using the Denar facebow (Fig. 5).

The rubber dam was placed and the first crown #11 was removed using a No. 330 pear shaped bur (KUT burs, Dental Savings Club) (Fig. 6), making a vertical cut through the porcelain and metal from the gingival margin through the incisal edge, with an effort being made to not cut the underlying tooth. The crown was then separated away from the underlying prepped tooth.



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We then removed any caries present with the aid of a caries detection dye, and then placed a well bonded composite core restoration (Build-it FR, Pentron Clinical) wherever necessary. It was determined that there was no need to disturb the post as it was stable with no caries around it, and was really not a functioning post anyway. We then continued on and prepared the tooth for the new crown. Using a round ended tapered extra coarse diamond (Brasseler 5855,31.016) with the tip diameter of roughly 1mm, we prepped the tooth for a 1mm chamfer finish line roughly 0.5 mm below the gingiva on the facial and proximal surfaces, and reduced the incisal by about 1.5-2.0mm for porcelain strength and esthetics (Fig. 7).

The same procedure was carried out on tooth #21. Once we were satisfied with our preparations, they were polished and then Consepsis scrub was used containing chlorhexidine, to decontaminate, and cleanse the prep prior to final impressioning (Fig. 8).

Once the final VPS impression was taken (Flexitime, Heraeus) and accuracy was reasonably ascertained, the provisionals were made one at a time, using the VPS stent taken prior to crown removal (Fig. 9). Intraoral modifications were made and then the provisionals were cemented with Temp Grip (Dentsply).

The case was then sent to Vivaclair Canada laboratory with a CD of preliminary and clinical photos, I then along with the technician had a discussion regarding the shape, contours and shade required.

The patient then returned to our office a short time later for a try-in and eventual bonding of these crowns. The crowns were tried in one at a time and verified for marginal fit, proximal contacts and occlusion. Then they were tried in again together, to insure that they still had a perfect fit. The patient then had a chance to approve the crowns for colour shape and contours. Once approved the crowns were bonded in place with self curing resin cement. Figure 10 shows the lifelike brilliance and the terrific gingival response one week after insertion.

The Milled Ti crowns were offered by Nobel Biocare and the ceramic used was Dentaureum's Triceram.

As one can see from the photo (Fig. 10), the final crowns look spectacular. The material (Triceram) allows for fabrication of a restoration with superior esthetics, blending into the natural dentition. Overall the product was so easy to work with and the gingival response to the titanium was as expected- fantastic. Many thanks to the expertise of Mr. Bassam Haddad of Vivaclair Canada dental laboratory for his attention to detail, and the spectacular work on this case.

LABORATORY PROCEDURE

Because I always strive to find the best materials for the patient and due to increased and out of control pricing of gold, as a technician after researching for the best metal available, Titanium was found as the best metal and solution, a metal that is known to professionals to be of high quality and bio compatibility. After researching and trying different products, we came to the conclusion that Triceram was the best suited ceramic on Titanium and zirconium with high bonding strengths and esthetics.

Received a perfect impression and lots of useful pictures from Dr. Les Rykiss. The chosen shade was 50% 1M1 and 50% 1M2 (from Vita 3D shade guide).

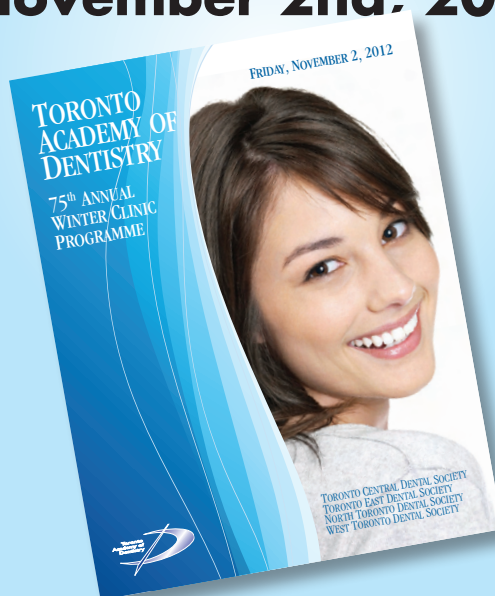
The model was poured and then scanned and the file was sent to Nobel Procera (Fig. 11A), a few days later the milled Titanium was received (Fig. 11B). The fit was verified under the microscope and was perfect. We resurfaced the copings by grinding them, preparing the butt joint (2mm for esthetic reasons) and sand blasting them with 125 microns aluminum oxide. After the fact the copings were cleaned by steamer, please note that a passivation of 10 to 30 minutes is necessary.

After passivation, we applied a thin layer of bonder and baked it. It is imperative that the bonder covers all areas that will be in contact with the ceramic, the idea is not to hide the metal (even if it is very tempting, since the Triceram's bonder has a nice white finish) but to cover all areas (Fig. 12).

Triceram from Dentaurem has a special additional kit (Chroma Concept kit) which enables the technician to create infinite shades easily by mixing different Chroma dentins.

As you can notice, porcelain shoulder was

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FIGURE 12



FIGURE 13



FIGURE 14



FIGURE 15



FIGURE 16



FIGURE 17

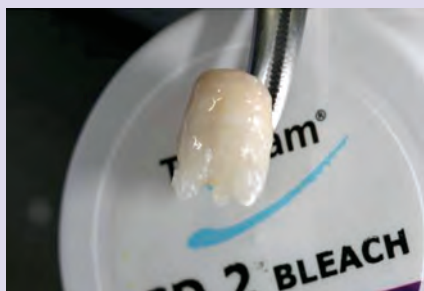


FIGURE 18



FIGURE 19



FIGURE 20

prepared and we used shoulder A material + White and Transparent material. The advantage from Dentaurem is that by mixing you can control the opacity and the fusion of light, the Triceram shoulder material is very stable after few bakes and there is no shrinkage. This is a big plus for the user and the patient will benefit from a perfect fit. In this case as you can notice we have applied about 2mm of porcelain shoulder and this was achieved very easily with only two bakes (Figs. 13-15).

Then we used A1 opaque and did 2 opaque bakes and for body a mixture of 50% A1 dentin with 50% CD2 (chroma dentine bleach) and finally used IT57 as incisal (Figs. 16 & 17).



FIGURE 21



FIGURE 22

After the first bake, internal stains were used: brown, orange and white on the lingual, and orange, white and pink on the buccal (Fig. 18). These stains were fixed at 20-30 C less than the dentine bake. Dentaurem stains are fluorescent and can be applied internally and externally.

A second bake followed by building up Transparent effect, Neutral, different incisals and

dentin: (TE1, IO3, NT, IT57 and mix dentin) (Fig. 19).

Because of the lower amount of shrinkage of Triceram, we could easily control the axes, position and shape of anterior crowns.

And finally a correction bake using B1 dentin as incisal frame, Neutral (NT), incisal (IT57) and some mix dentin (Fig. 20). We polished manually some areas

and lobes comparing with pictures sent by Dr. Rykiss from different angles. I compared the diffusion of light from different surfaces and calculated where the effects and the line angles (visual surfaces) should be; we defined and created some flat mirror surfaces and rough textures to diffuse the light in the same way as the pictures.

I believe a good technician is one who can control his material and drive it in the right position and not the material that controls the user as sees fit. Triceram is a very comprehensive and forgiving ceramic (granted you always follow the manufactures instructions) multiple firing does not affect the shade nor the shape of Triceram ceramic and has a very low shrinkage; it is a very natural and vital ceramic. A satisfied smile from the patient is

the ultimate reward of a job well done for both the dentist and the technician (Figs. 21 & 22). With Triceram, practitioners can feel the beauty of nature!

Acknowledgement

I would like to thank Mr. John VanDyck, Manager from Nobel Procera for offering the Titanium Copings and Dentaurum's sales manager Mr. Sourena Ghandehari C.D.T for his help and guidance.

OH

Les Rykiss obtained his degree at the U. of Manitoba and is also a graduate and Mentor at the Nash Institute for Dental Learning in Charlotte, NC. He has an Associate Fellowship in Laser Dentistry from the WCLI, teaches restorative and pediatric dentistry and writes articles on cosmetic dentistry and hard and soft tis-

sue laser use. Dr. Rykiss currently maintains in private practice in Winnipeg, MB.

Bassam Haddad, CDT Graduated from Antonine University in Lebanon in 1989. He acquired a global and unique experience in the various systems of the dental technology by following courses with the biggest masters of the domain in Switzerland, Germany, France, Canada and the United States. He is member of the AACD as well as the CAED. He is known for his skills to mix colors and to manipulate forms to create teeth as natural and alive as esthetically perfect. He is known for mastering very complex dentistry cases. He is the owner of Vivaclair Canada dental laboratory situated in Montreal.

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