

A reliable method for cementing ceramic veneers

Roberto Carlos Tello Torres¹

Achieving the most perfect adhesive cementation possible for ceramic restorations depends on the interplay between ideal cementation material and correct application procedure. Only in this way can durable esthetic results be attained.

Adhesive luting composites are used for the permanent cementation of ceramic restorations. Given the trend towards minimally invasive treatment methods, today's resin cements fulfil important additional functions: they must establish a firm bond between the restoration and minimally prepared tooth structure. Often only fragment ceramic restorations or ultrathin veneers are inserted. As restorations in ever thinner thicknesses of ceramic are used, it is important to ensure that the cementation material does not have an adverse effect on the esthetic result. In some cases, a colour-matched luting composite may even be used to bring the restoration closer to the desired tooth shade.

The dentist is responsible for the cementation procedure and should be aware of the advantages and disadvantages of the individual materials and their indications. Resin cements have been undergoing consistent further development over the years with the result that adhesive luting composites have become an integral part of restorative dentistry today.



Figure 1: Discoloured composite restorations 20 on teeth 11 and 21.

¹ Dr Roberto Carlos Tello Torres, DDS
Department of Oral Rehabilitation
Faculty of Dentistry
University Inca Garcilaso de la Vega, Av. Bolivar 165
Pueblo Libre · Lima 21, Peru
Btello_torres@me.com



Figure 2: Restoring the cavity after removal of the restoration and of the carious tissue on tooth 21.



Figure 3: Polishing the tooth after initial treatment.

Versatile applications

Variolink® Esthetic is available in a LC (light cure) and DC (dual cure) version and effectively combines the beneficial properties of the predecessor product, but not only: the field of application of Variolink Esthetic has been extended to include a large number of clinical indications. The working time has been optimized and excess material can be removed in a reasonable amount of time. In addition, the product features an ideal consistency and allows restorations to be placed without strain or tension.

The LC version is suitable for translucent glass-ceramic restorations having a thickness of up to 2 mm. The dual cure version Variolink Esthetic DC should be used if the restoration is thicker or made of a less translucent glass-ceramic material.

Good communication with the dental technician is of advantage here. Not only the shade but also the translucency and opacity of the ingot used for the ceramic restoration should be known to the dentist. This information assists in selecting the appropriate luting composite.

Esthetic requirements

Ideally, an adhesive luting composite should maintain its esthetic properties for many years. Until recently, esthetic stability has been an issue with luting composites as they were prone to discolouration due to the tertiary amines contained in them. Variolink Esthetic is an adhesive luting composite that does not comprise tertiary amines. Consequently, a durable stable shade is ensured. The LC version results in a neutral shade effect, which completely “camouflages” the ceramic restoration and thereby provides an effective chameleon effect.

Radiodiagnostics

Excess removal is another challenge associated with the adhesive cementation technique. Residual material accidentally left on the tooth may cause the gingiva to recede. Given its radiopacity, Variolink Esthetic facilitates the X-ray identification of cement residues, which are difficult to spot by the naked eye. Additionally, the product supports long-term sealing or correction of clinically caused maladaptations.

Compatibility

Using a high-quality ceramic material (e.g. IPS e.max®) for the restoration and a leading-edge adhesive luting material forms the basis for attaining outstanding esthetic results. Variolink Esthetic is compatible with Tetric N-Bond®

Universal – an adhesive that can be used on both enamel and dentin and is suitable for all etching techniques: selective-etch, total-etch (etch and rinse) and self-etch. The adhesive is thoroughly scrubbed into the tooth structure for 20 seconds and then dispersed and polymerized for 10 seconds. This procedure does not interfere with the accuracy of fit of the restoration, as it results in an ultrathin film of only 10 µm.

Case report

A 29-year-old patient consulted our practice about having her restorations on teeth 11 and 21 replaced (Fig. 1). The restorations showed noticeable staining and deformation. To make an accurate diagnosis, I began by determining the actual extent of the restoration surface. It is advisable to use pictures taken with a polarization filter (polarized light) to do this.



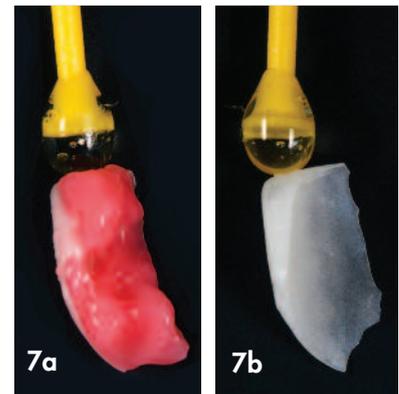
Figure 4: Prepared teeth with retraction cord in place, ready for impression-taking.



Figure 5: Lab-fabricated glass-ceramic veneers.



Figure 6: Try-in with try-in paste (in shade "neutral").



Figures 7a and b: Conditioning the veneers with 5 % hydrofluoric acid and silane.

For the actual treatment, the teeth were isolated with a rubber dam and the secondary caries was removed (Fig. 2). A cavity liner (Vivaglass® Liner) was applied to tooth 21 to protect the dentin and pulp. For additional protection, I applied an adhesive, Tetric N-Bond-Universal, and a thin composite layer of IPS Empress Direct® Color A1 Dentin. Once the initial treatment was completed, the tooth was polished (Fig. 3). I removed the rubber dam and placed a retraction cord to take an impression (Fig. 4). Before placing the temporary restorations, the dentin shade was determined. I then consulted with the dental technician and we decided that the permanent restorations should be manufactured using IPS e.max Press LT ingots (Low Translucency) in shade BL4. This shade was ideal to block out the dark backdrop caused by the seethrough effect of the diastema. In addition, it was decided to build up the incisal area with the IPS e.max Ceram layering ceramic (Fig. 5).

At the second appointment, the ceramic restorations were ready for seating. Once the temporaries had been removed, the prepared teeth were cleaned and the fit of the restorations checked on the patient. I then assessed the shade match using one of the try-in pastes. I selected the neutral shade because I did not want the shade of the restoration to be altered by the adhesive luting composite (Fig. 6).

For their permanent cementation, the ceramic restorations were conditioned with 5 % hydrofluoric acid for 20 seconds (Fig. 7a). The acid was rinsed off into a container and the contaminated water was neutralized to prevent any environmental risk. Next, a silanating agent (e.g. Monobond N) was applied (Fig. 7b). This step was carried out with the help of an application instrument that has an adhesive tip (e.g. OptraStick®).

The sticky tip prevents the miniscule restorations from falling off the instrument. Once the restorations were prepared, I



Figure 8: Rinsing after application of 37 % phosphoric acid.



Figure 9: Applying Tetric N-Bond Universal adhesive.



Figure 10: Inserting the veneers loaded with Variolink Esthetic LC.

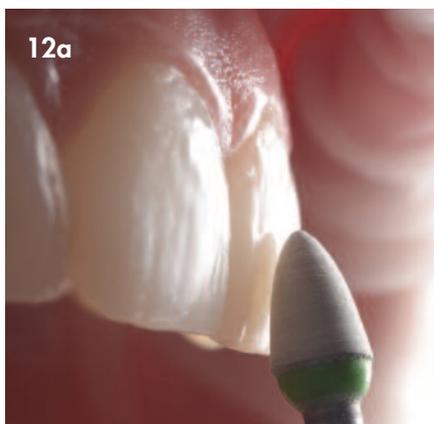


Figure 11: Light-curing the luting composite.

completely isolated teeth 11 and 21 using a rubber dam and additional isolation with Teflon tape. Next, 37 % phosphoric acid was applied (e.g. N-Etch), rinsed off (Fig. 8) and dried.

Once dried, the preparations were coated with Tetric N-

Bond Universal adhesive (Fig. 9). The solvent was evaporated with a strong stream of air to achieve a thin adhesive film. This was followed by light-curing for 10 seconds. Next, the actual cementation procedure with Variolink Esthetic in the shade "neutral" was carried out. I



Figures 12a and b: Final polishing and result immediately after cementation.



Figure 13: Four months later. Harmonious integration of the ceramic veneer restorations following completion.



Figure 14: Final view of the lips.

placed the restorations with the help of an OptraStick, removed any excess with a brush and then polymerized the luting composite (Fig. 10). I then carried out the same steps on the other tooth. After both restorations were placed, glycerine was applied to prevent the formation of an oxygen inhibition layer during final light-curing of the luting composite (Fig. 11). After rinsing, I removed any remaining residual material with the help of a scalpel. Once the isolation was removed, I polished the restorations using special rubber polishers as per the recommendations of the manufacturer. Polishing should be performed using an appropriate rotational speed and adequate cooling (Fig. 12a). At the end, I took pictures of the final result after cementation (Fig. 12b).

Four months later, the patient came for her first check-up (Fig. 13). I re-polished both restorations lightly and examined them again. Photographic documentation taken in polarized light confirmed the successful integration of the restorations.

Conclusion

We succeeded in achieving an optimum level of synergy between the materials presently available (Fig. 14). The glass-ceramic, adhesive luting composite and adhesive have all contributed to the lifelike esthetic appearance of the final restoration. The patient gives us a natural and harmonious smile.

Reprinted with permission by Reflect 3/2016