A reliable method for cementing ceramic veneers

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

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