Sticks to the teeth – not the instruments

The direct restoration of multiple defects, in particular old restorations with secondary caries, places considerable demands on both the clinician and the materials.

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Compared with indirectly fabricated restorations, the effort is considerably less, as these generally require a temporary restoration as well as a second treatment session following conventional impression-taking. The fabrication of individual full ceramic restorations after optical scanning and subsequent automated fabrication is, of course, a single appointment alternative, does however, require investment in this technology.

A prerequisite for the successful, direct preparation of restorations with purely light-curing composite materials in the layering technique, is avoiding tension during volumetric shrinkage which occurs during polymerisation.

The adhesives and hybrid composites should be compatible with each other and offer good long-term performance. This is reflected both in vitro tests as well as in vivo long-term studies.

Sticks to the teeth and not the instruments. One of the requirements for state-of-the-art adhesives and composites is safe handling during the preparation of the restoration.

This implies a good uniform wetting layer when applying the adhesive and convenient modelling properties of the hybrid composite which allow the clinician safe adaptation to the bonded tooth.

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Permanent protection against leakage in the marginal region is a prerequisite. Last but not least, the result achieved with a composite in terms of colour, gloss and abrasion has to be reliable in the long term. This result is complemented by a technically reliable adhesive through permanent impermeability of the restoration margins. The practical implementation of a direct restoration, combining adhesive and composite, and an evaluation of the prerequisite material requirements, are discussed in the following case study.

In this case, the patient presented with insufficient restorations (Fig. 1). The restoration margins revealed leakage and discoloration. The gap closure between 35 and 37 was particularly irritating for the patient. The X-ray image (Fig. 2) revealed secondary caries and the approximal situation. The teeth involved were cleaned, as were the adjacent teeth, while waiting for block anaesthesia to come into effect. The placed Flexi Dam permitted a good overview and provided good conditions for drying the work area and thus for a permanent adhesive bond between tooth and restoration. The old restorations were removed entirely and the secondary caries was excavated (Fig. 3).

ONE COAT 7 UNIVERSAL was applied as adhesive. ONE COAT 7 UNIVERSAL is an MDP-based, light-curing single-component bonding agent which can be applied in self-etching, selective etching or total etch techniques. The tooth surface is conditioned with Echtan Gel S and an S.P.E.C. 3 LED lamp is used for polymerisation (Fig. 4).

After excavation of the secondary with insufficient restorations (Fig. 9) and proximity to the pulp chamber. Pulpone® spray and conditioning is indicated. Selective etching of the enamel with Echtan Gel for 90 seconds is followed by a shortened Total Etch for 10 seconds (Fig. 5). Then the etchant was removed thoroughly by rinsing for 20 seconds and the cavities were dried with air. Immediately afterwards, ONE COAT 7 UNIVERSAL was applied with a brush to maintain adequate moisture and to provide complete cover prior to placing the matrix (Fig. 6). The adhesive is gently flushed with an air blower and polymerised with the S.P.E.C. 3 LED lamp for 10 seconds.

A variety of partial matrix systems are available for a sophisticated design of the approximal surfaces. Here we used a REOKO tension-free steel matrix band and trimmed it to the desired length as a partial matrix. This band is available in different widths and material strengths.

The nonelastic properties of the material make anatomical customisation extremely easy. The thickness of the band in the area of the contact point can be minimised effectively by thinning. Fixation and basal sealing of the trimmed partial matrix is performed with a wooden wedge, and for lateral sealing the band edges are pressed into the occlusal surface using a clamping ring.

The design of the approximal surface (Fig. 7) with BRILLIANT EverGlow A3/D3 (Fig. 8) is very simple. The restoration margins to the consistency-setting of the dental restoration material such as BRILLIANT EverGlow can be generated, are dispersed with air. The desired result is a tight, spherical contact. Approximal convexity can be customised very easily in this manner. This is again followed by designing the approximal surface with BRILLIANT EverGlow A3/D3 as well as the anatomical morphology of the occlusal surface. Due to the well sealed partial matrix and surface by the clamping ring, the finishing effect is maintained. A3/D3 (Fig. 9). The restoration margins to be brought to a high gloss using an occlusal check and minor corrections were performed. Polishing takes little time as BRILLIANT EverGlow delivers its gloss very quickly (Fig. 10).

The clinical long-term objective of sealed restoration margins can be achieved with even greater certainty when using a reliable adhesive such as ONE COAT 7 UNIVERSAL, which was used here. ■

Sticks the way it should, to the tooth and not the instrument. Due to the consistency setting of the dental restoration material such as BRILLIANT EverGlow, application is easy and results in anatomically correct outcomes.

Submicron hybrid composites offer an impressive rapid and consistent gloss. Appropriate shades and an easy to achieve gloss due to intelligent filler design provide the desired and sustainable aesthetics.

Permanent protection against leakage in the marginal region is a prerequisite. The high density and composition of the filler particles of the BRILLIANT EverGlow composite optimise the results in terms of reducing shrinkage and the resulting lower shrinkage stress.

The clinical long-term objective of sealed restoration margins can be achieved with even greater certainty when using a reliable adhesive such as ONE COAT 7 UNIVERSAL, which was used here. ■