

Sticks to the teeth – not the instruments

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

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 res-

torations 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 in-vitro tests as well as in 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 apply-

ing the adhesive and convenient modeling properties of the hybrid composite which allow the clinician safe adaptation to the bonded tooth.

Submicron hybrid composites offer an impressive rapid and consistent gloss. The filler composition should enable achieving 'an' impressive gloss of the surface during preparation and polishing.

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 adhe-



Fig. 1: Insufficient restorations with secondary caries



Fig. 2: X-ray 3. quadrant, missing approximal contact 35/37



Fig. 3: Condition after removing the insufficient restorations



Fig. 4: ONE COAT 7 UNIVERSAL is used for adhesive mounting of the direct restorations

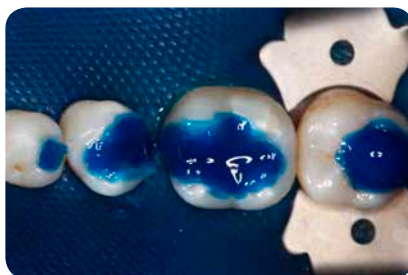


Fig. 5: Filling the cavities with Total Etch for 10 seconds



Fig. 6: Application of ONE COAT 7 UNIVERSAL with a brush

sive 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 used 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 Etchant Gel S and an S.P.E.C. 3 LED lamp is used for polymerisation (Fig. 4).

After excavation of the secondary caries, the cavity floor of 35 is in close proximity to the pulp chamber. Pulp-conserving

acid conditioning is indicated. Selective etching of the enamel with Etchant Gel S for 30 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 care. 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 ROEKO 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 to the tooth surface using a clamping ring.

The design of the approximal surfaces (Fig. 7) with BRILLIANT EverGlow A3/D3 (Fig. 8) is very simple. The mate-

rial keeps its shape and does not stick to the instrument. Coated instruments are of advantage here, especially filling instruments work better. There are no limits to creating the morphology of the occlusal surfaces as the consistency of BRILLIANT EverGlow offers excellent modelling properties. Delicately modelled fissures (for example, using an endo needle) remain open and do not merge again, customisation is truly enjoyable with this material.

After removing the matrix, the approximal surface is given a spherical design using an EVA file, any bonding expressed basally from the matrix is removed, and the transition from the tooth to the restoration is brought to the same level. The matrix is applied distally to premolar 35 and sealed basally with a wooden wedge and laterally with a clamping ring. ONE COAT 7 UNIVERSAL is applied and gently air-cleaned after an exposure time of 20 seconds. ONE COAT 7 UNIVERSAL is polymerised with the S.P.E.C. 3 LED lamp for 10 seconds (Fig. 9). The matrix, which has now been stabilised by bonding, is then thinned out swiftly using a zirconium round burr in anti-clockwise rotation, yet without water. At the same time, the partial matrix must be reliably fixated by the wooden wedge. Metal chips were avoided by using anti-clockwise rotation. Any metal chips that may still be generated, are dispersed with air. The desired result is a tight, spherical con-



Fig. 7: Reconstruction of the approximal wall with BRILLIANT EverGlow



Fig. 8: BRILLIANT EverGlow A3/D3 syringe



Fig. 9: Polymerisation of ONE COAT 7 UNIVERSAL with S.P.E.C. 3 LED

tact. 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 aided by the clamping ring, the finishing effort required after their removal is minimal. Using the EVA file, the result is already very satisfactory (Fig. 10). An occlusal check and minor corrections were performed. Polishing takes little time as BRILLIANT EverGlow delivers its gloss very quickly (Fig. 11). Then the restorations are brought to a high gloss using an occlubrush. In their final form, the restorations are more than satisfactory (Fig. 12).

The applied layer method of the BRILLIANT EverGlow submicron filled hybrid composite in combination with the ONE COAT 7 UNIVERSAL adhesive delivers very good results. The S.P.E.C. 3 LED polymerisation lamp provides reliable curing of both restoration materials at high conversion.

Conclusion and comments regarding the initially demanded material properties:

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.

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Fig. 10: Restoration after removing the matrix



Fig. 11: Polishing of the restorations



Fig. 12: Finished restorations with BRILLIANT EverGlow