

INDIRECT COMPOSITE ADHESIVE RESTORATION USING DUAL CURING COMPOSITE MATERIAL BUILD-IT FR

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Build-It FR (Pentron), a dual curing composite material is suitable for many clinical cases. In this case, we will focus on using it in indirect restoration workflow not only as a build-up, but also as a material for the so called “Resin Coating” technique.

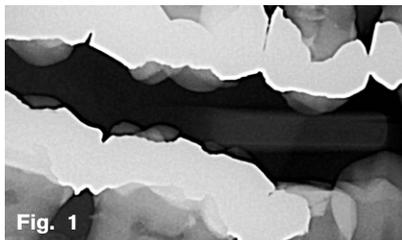
Modern dentistry is very focused on minimally invasive treatments. Thanks to adhesive technology, we are able to save the maximum amount of tooth structure when making an indirect esthetic restoration. In many cases, we are able to save the vitality of the pulp. Coating with an adhesive resin can significantly improve the bond strength in indirect workflows on vital teeth. This is very similar protocol to what is well-known as Immediate Dentine Sealing (IDS). It is performed by sealing the dentine using highly filled dental adhesive of the 4th generation (Optibond FL (Kerr)) at the first visit, just after the preparation is finished and prior to impression making and regenerating the adhesive surface via sandblasting at the second visit. Resin coating enhances IDS by using various adhesive systems of the 4th and 5th generation with better visual control. There is also low risk of completely removing the hybrid layer from the bonded surface with excessive sandblasting at the second visit.

Part of the complete treatment of our patient was the reconstruction of a mandibular-right posterior teeth due to defective old amalgam restorations of teeth 45, 46, and 47 (Fig. 1). Teeth 45 and 46 were reconstructed directly using Build-It FR A3 (Pentron) as a core of the restoration and Simile A2 (Pentron) for the occlusal surface. Tooth 47 will be reconstructed using an indirect technique (Fig. 2).

After applying local anesthesia, all the defective restorations and residual caries were removed. The buccal and distal portions of the preparation were

located slightly subgingivally, so gingivectomy was accomplished using electrosurgery. (Fig. 3). A rubber dam was placed, and possible leaking areas were covered by a liquid rubber dam. (Fig. 4)

The dentine was etched with Phosphoric Acid Gel Etchant 37.5% (Kerr) for 15 seconds (Fig. 5), and then rinsed with water for 30 seconds. After gently air drying, an adhesive system of 5th generation was applied (Bond-1, Pentron) (Fig. 6) and light-cured for 20 seconds. Then Build-It FR A3 (Pentron) was applied in a thin layer onto the bonded surface (Fig. 7, 8), forming a layer of composite material to seal the dentine and level the uneven bottom of the preparation elim-



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Build-It™ FR

Fiber Reinforced Core Material

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inating any undercuts. After 3 minutes of self-curing, the material was light-cured for 40 seconds (Fig. 9).

This workflow – the Resin Coating - seals the dentine just after the preparation, performing the best adhesion and eliminating risk of contamination of dentine tubules and also decreasing the chances of any post-operative sensitivity.

The tooth was then prepared for a composite onlay achieving the anti-rotational shape of the cavity (Fig. 10). A single retraction cord was applied and an impression was made using Delikit A-silicone in a single step-double mix technique. A2 was selected as the color shade using the neighboring teeth as a reference. (Fig. 11). To cover the tooth, the preparation was protected with a light curing temporary material (Clip, Voco) to prevent movement of the tooth.

One week later, the final restoration was made of Signum ceramis (Hereaus Kulzer) radiopaque composite resin in a the dental laboratory using sectional and control plaster models. (Fig. 12, 13).

At the second visit, the adhesive cementation was performed. After placing the rubber dam, the surface of the preparation was sand-blasted with Al₂O₃ particles



Fig. 9



Fig. 14



Fig. 10



Fig. 15



Fig. 11



Fig. 16



Fig. 12

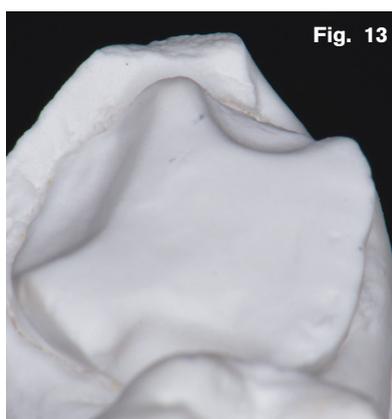


Fig. 13

(25 µm) and silanated with Monobond Plus (Ivoclar Vivadent). Silane was reacting with the surface for 60 seconds. The enamel of the tooth was etched with Phosphoric Acid Gel 37% (Etching Gel, Pentron) for 30 seconds. The surface covered by composite resin was silanated with Monobond Plus (Ivoclar Vivadent) for 20 seconds. The adhesive, Bond-1 (Pentron), was then applied onto the adhesive surface of the restoration and into the cavity and air-thinned. For final cementation, a pre-heated highly filled light-curing composite restorative material Simile A3.5

(Pentron) was used. After seating the restoration and the excess cement removed, each surface was light cured for 90 seconds. The complete removal of excess and proper seating was verified by X-ray (Fig. 14). Then the occlusion was adjusted, and the restoration was polished (Fig. 15, 16).

As other dual-curing composite materials, Build-It FR is compatible with all dental adhesives of the 4th and 5th generation. As with most self-etching adhesives of 6th and 7th generation, there is an adverse reaction between the acid monomers of the adhesive and the chemical setting accelerator (tertiary amine) of Build-It FR, resulting in insufficient polymerization. Some newer self-etching adhesives have solved this problem, but always check for potential material incompatibility.

Contemporary dentistry considers the natural dental tissue as the best material. In the case of larger restorations, adhesively cemented inlays/onlays/overlays are preferred instead of traditional full coverage crowns. This philosophy seems to be accurate because after failure of the partial restoration, it still leaves enough hard tissue for a future preparation.

Build-It FR can be used in many clinical situations, especially with adhesively cemented ceramic or composite indirect restorations, but also in direct workflows. I found a big advantage in the handling – it is a thixotropic material – flowing into the cavity when agitated but thick enough when left untouched. It has a great performance at a reasonable price.

