Simplifying direct composite resin restorations in the aesthetic zone

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The ability to create highly aesthetic direct composite resin restorations in a simplified manner has long been a goal for practicing dentists. In the past, difficulties with direct composite resins have included shade matching, handling properties, premature setting under operatory lights, and the overall ease of use. This article will describe a composite resin system (Amaris, VOCO, Cuxhaven, Germany) that has demonstrated desirable properties for use in both posterior teeth and especially in the aesthetic zone. Then, a case report demonstrating the use of the material will be presented.

Two-step shade matching concept

Tooth color, with its varying shades and translucencies, is difficult to achieve between composite systems. Resins based on the porcelain VITA Classical shade guide (Vident) cannot achieve the desired results with consistency. Most composite systems work on the principle of matching composite to the basic shade ranges found in dentin and enamel. In order to create the polychromatic effect found in natural enamel and dentin, several things must happen. To mimic the optical properties of hydroxyapatite enamel rods, composite resin must create the illusion of the way light is reflected in the natural tooth. Dentin is by nature opaque providing teeth with their basic shades of yellow, brown, gray, and blue. Enamel is by nature a white-translucent shade, providing teeth with their natural value. Using this basic principle, aesthetics accomplished when using Amaris is simplified for everyday use with an easy to understand, 2-step shade concept with 5 opaque "dentin" and 3 translucent "enamel" shades. Choosing the correct shade is simplified by using the custom shade guide, which is made from original light-cured composite material. Color matching is greatly simplified because one does not have to employ a complicated and time-consuming multilayer shade technique. With minimal effort, color matching is developed "as you go." Because the color of dentin "shines" through enamel, this system offers a shade system that follows this natural principle, simplifying direct aesthetic composite restorations into 2 simple steps. The material demonstrates an excellent chameleon-like effect with non-opaque shades and outstanding shade matching on the tooth. This excellent adaptation makes complex (shade) layering techniques unnecessary, and delivers an aesthetic result with fewer shades.

Application possibilities

Amaris is a hybrid composite suitable for all classes of restorations. It is stable in posterior teeth and highly aesthetic for anterior teeth. A flowable version (Amaris Flow) supplements the restorative possibilities. With

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excellent wettability properties, the material flows directly out of the syringe into extremely small cavities. It is available in 2 special universal shades: high translucent (HT) and high opaque (HO). The HT flowable is ideal for highly translucent incisal edges, small enamel or incisal defects, and as a high-gloss finishing layer. HO flowable is perfect for thinly masking discolorations, as a restorative base following endodontic treatment, covering amalgam stains, mimicking the cervical areas in older teeth, and blending with adjacent PFM crowns. Optimal matching of Amaris Flow to Amaris paste (in shade and translucency) allows combined application with the composite-bonded- to-flowable technique, without reducing the stability or aesthetics.

Surface hardness and abrasion

The abrasion caused by chewing load is still a central aspect for the durability of restorative dental materials. High abrasion rates in the posterior tooth region lead to edge fractures and loss of the occlusion. Abrasion in the anterior tooth region leads to loss of luster, which makes the restoration appear dull and unaesthetic. It is thus a fundamental goal of the development of restoratives to optimize hardness and abrasion resistance. The extremely high-filler content (80.0 w/w %) provides Amaris highly aesthetic hybrid composite with an exceptionally hard surface. This insures a durable restoration due to its high physical strength and a high polish abrasion resistance.

Many filling materials can be polished to a high gloss simply because they are not particularly hard. The materials lose their shine within a short amount of time due to poor abrasion resistance; aesthetics at the price of durability is not a good compromise. In the author's experience, Amaris composite exhibits excellent polishing characteristics, high gloss, and very good gloss retention. In addition, up to 8 minutes of handling time in ambient operatory light, an additional bleach opaque shade, and 2 flowable choices covers all clinical situations helping to make this a versatile material.

The following case report demonstrates a clinical situation where this composite system was successfully utilized to achieve optimal anterior aesthetics.

Case Report

The patient, a 23-year-old female presented with a chief complaint of discolored, fractured, and sensitive maxillary anterior central incisors (Figure 1). Direct composite restoration was selected as the treatment of choice to correct the aesthetic deficiencies, tooth sensitivity, and structural flaws with minimal tooth reduction. Following administration of local anesthesia, minimal tooth preparation was accomplished using a football-shaped diamond bur (SS White) and a standard round end tapered chamfer diamond bur (SS White), (Figures 2 and 3). The stained enamel was removed and a scalloped preparation margin was created at the interproximal of both central



Figure 1: Preoperative photo: Maxillary anterior teeth were discolored, fractured, and sensitive.



Figure 2: Stained enamel was removed, and a scalloped margin prepared.



Figure 3: Margins were created at the interproximal surfaces of both teeth.

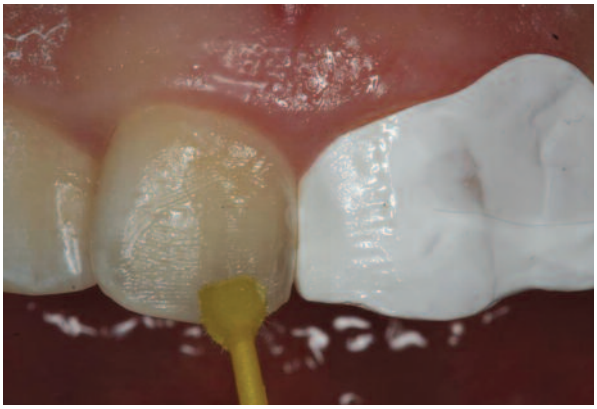


Figure 4: Next, a self-etching, dual-cure bonding agent (Futurabond DC, VOCO) was applied.



Figure 5: A custom shade tab was used to determine the correct opacious dentin color.

incisors. Discoloration at the composite-tooth junction (ie, margin) is an indication of microleakage and can be an indicator for the presence of caries. The frequency of margin discoloration is affected by the adhesive chosen, the adhesive technique utilized, the composite itself, and the finishing technique employed.

The left central incisor was first isolated from the bonding procedure using Teflon tape. The right central incisor was then treated with a dual-curing nano-reinforced self-etching adhesive (Futurabond DC, VOCO), Figure 4) and light-cured. Next, an opaque-dentin shade button was selected that best matched the tooth. The Opaque (O1) (Amaris shade tab, VOCO) was matched to both the prepared tooth and the adjacent unprepared lateral incisor (Figure 5). The O1 composite was then tried against the prepared tooth (Figure 6) and sculpted, leaving a 0.5 mm thickness for the final enamel layer (Figures 7 and 8). This composite was designed so that it does not stick to instruments and it allows it to be shaped in the cavity with simple movements, using almost no pressure.



Figure 6: O1 composite (Amaris, VOCO) was tried against the prepared tooth.



Figure 7: An initial layer of O1 was applied.



Figure 8: A second O1 increment was then placed.



Figure 9: A custom shade tab was used to determine the correct translucent enamel color.



Figure 10: TL composite (Amaris, VOCO) was tried against the prepared tooth.



Figure 11: TL composite was then sculpted to shape completing the restoration.



Figure 12: Photo of the restored maxillary right central incisor next to the unrestored left central incisor.



Figure 13: A dual-cure bonding agent (Futurabond DC, VOCO) was applied to the left central incisor.



Figure 14: O1 dentin replacement was applied.

Next, the Translucent Light (TL) Amaris shade tab was matched to both the prepared tooth and the adjacent lateral incisor (Figure 9). Then, the TL composite was tried against the prepared tooth (Figure 10), and this final enamel layer was sculpted to place (Figures 11 and 12). These same steps were then done for the maxillary left central incisor (Figures 13 to 15). Once both maxillary central incisors were restored (Figure 16) and the occlusion was checked, the restorations were finished to proper anatomic morphology (Figure 17) and polished (Figure 18).



Figure 15: A final layer of TL composite was placed.



Figure 16: The maxillary central incisors, restored with unfinished composite.



Figure 17: The restorations after contouring and shaping, before finishing and polishing.



Figure 18: The completed case.

Conclusion

A technique for placing direct composites that allows a predictable final outcome in the aesthetic zone has been demonstrated. In the author's opinion, the simplicity of shade matching and aesthetics, ease of application, finishing, and polishing, as well as the strength and durability make Amaris an ideal choice as a direct restorative material.