Recognising the unique biological architecture of the natural tooth, dentists today practice conservative procedures and minimally-invasive techniques in order to preserve the maximum amount of healthy structure when restoring dentition to proper form and function. This can prove challenging when combined with patient expectations for an aesthetically pleasing smile and the predilection toward biomodification and biomimetics in modern dentistry.

Additionally, visual ergonomics is of optimal importance when restoring the anterior segment of patients presenting with Class IV fractures that have been previously restored.

Direct Composites

In the past, recreating the unique characteristics of natural dentition could be difficult and confusing. Manufacturers released multiple composite shades, opacities, and translucencies, all of which were required to reconstruct individualised teeth. Therefore, the direct composite placement technique became overwhelming and time consuming.

Fortunately, dental material manufacturers have helped to improve and enhance dental treatments by developing direct composites that simplify the layering process. Today’s biomimetic direct composite materials reduce the amount of composite colours required to recreate aesthetic restorations and simplify and enhance predictability. These new composites address demands for minimally-invasive treatments while providing increased strength and optical characteristics, universal application, improved adhesion, and optimal handling and sculptability when reconstructing the biological, aesthetic and physical architecture of natural teeth.

Among the new alternatives available is a nanohybrid indicated for Class I – Class V restorations. GrandioSO (VOCO) is a newly developed universal nanohybrid restorative that displays greater wear resistance, enhanced colour stability, long-lasting polish retention, natural dentition-like flexural strength, and low shrinkage. GrandioSO is unique due to its construction that includes 30–50% less resin compared to other microhybrid resin-based restoratives. GrandioSO contains very small designer nano-particles made from silica-dioxide filler particles grown to 20–40 nanometers, then covered with a special coating. Glass ceramic fillers with an average particle size of 1µm, combined with the designer nano-particles, create a nanohybrid composite that outperforms conventional composites that have limited use.

Reduced Shrinkage

The rate of polymerisation shrinkage in the newest, modern generation composites reaches 2-2.5% when curing. However, the low-resin content construction of GrandioSO decreases shrinkage to 1.6%, reducing stress and, as a result, eliminating the undesirable ‘white line’ that often appears with resin-based composites during the finishing process.

The unusually high surface hardness found with GrandioSO results from the increase in filler load. Conventional composite filler weights range from 70-77% to GrandioSO’s 89%. Due to its unusually high surface hardness, GrandioSO displays greater wear resistance, enhanced colour stability, long-lasting polish retention, natural dentition-like flexural strength, and low shrinkage.

Figure 1: Preoperative view of the patient’s natural smile

Figure 2: Close-up preoperative view of teeth 11 and 21

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hardness (210.9 Vickers microhardness, MHV), GrandioSO is the closest composite to natural enamel (350–450 MHV). It maintains its strength, is highly polishable, and demonstrates long-term abrasion and wear resistance. In addition, the composite retains surface smoothness and a permanently polished sheen.

While careful composite selection and artful procedures during placement protocol are still required when emulating natural tooth structure, shape and shade while blending with surrounding dentition, the availability of new nanohybrid composites such as GrandioSO enable simplified techniques. This article describes how GrandioSO was used to re-restore the maxillary anterior teeth of a 48-year-old woman. Old and discoloured Class IV composite restorations on teeth 11 and 21 were removed, and the patient’s smile rejuvenated using the GrandioSO composite and a predictable two composite layering technique.

**CASE PRESENTATION**
A 48-year-old woman presented with 15-year-old composite restorations on her anterior maxillary teeth (Figures 1 and 2). The patient was not interested in porcelain veneers or unnecessary removal of tooth structure. She requested only reversible and repairable restorations.

**TREATMENT PLANNING**
Before the pre-existing composite restorations were removed, the patient’s occlusion was analysed. A comprehensive intraoral examination was performed that included an oral history, radiographs, and photographs. The patient was in good health, and nothing contraindicated direct composite re-

**PREPARATION PROTOCOL**
Before the original composite restorations were removed, a diagnostically-enhanced model was created from preoperative impressions (Figure 5). This model would also be used for fabricating a high-viscosity putty stent (Registrado X-tra, VOCO) that, when placed intraorally, would provide a spatial reference and volumetric guide for composite placement (Figure 6). This stent would also

**PRODUCTS USED**

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<thead>
<tr>
<th>Product</th>
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<tr>
<td>GrandioSO</td>
<td>VOCO</td>
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<td>Registrado X-tra</td>
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<td>Vococid</td>
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<td>Futurabond DC</td>
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<td>Tooth polishing discs</td>
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help maintain the facial/lingual line angles\textsuperscript{11}. The old restorations were removed, and teeth 11 and 21 were prepared using diamond burs. In addition, a 2.5mm infinite facial bevel was created (Figure 7). Combined, this preparation design supported the fracture resistance and durability needed for the restorations and facilitated imperceptible restorative margins\textsuperscript{12}.

The Class IV preparations were then verified incisally, after which the teeth were pumiced, rinsed and dried. Although manufacturers have developed newer generations of self-etching adhesives that demonstrate predictable long-term bonding and marginal integrity, selective enamel etching is still advocated in the literature to ensure excellent clinical results\textsuperscript{13-16}. Thus, the preparations were etched with 35% orthophosporic acid (Vococid, VOCO) for 15 seconds, rinsed, and dried (Figure 8). Then, a single-dose bonding agent (Futurabond DC, VOCO) was applied onto the preparations using a brush for 20 seconds (Figure 9). The selected bonding agent eliminated evaporation, would not spill, and required fewer steps, thereby helping to reduce technique sensitivity. The bonding agent was air-thinned with high pressure and light-cured for 10 seconds per tooth.

The putty stent was placed intraorally and GrandioSO composite in shade A2 was applied in a 1.5mm-thick increment to form the lingual enamel layer and block any show-through on tooth 21 (Figure 10). This layer was cured for 10 seconds (note that darker shades require 20 seconds). In order to assess this lingual enamel layer, the putty stent was removed. To simulate higher value and lower chroma in the middle and incisal thirds of the maxillary central incisor, the putty stent was placed intraorally again, and the A1 composite shade was placed, sculpted, and cured for 10 seconds. The re-restoration of tooth 11 happened analogously (Figure 11 to 13).

The restorations were then finished using a series of discs (Figure 14) and contour, shape, and shine cups and points\textsuperscript{17}. These helped to ensure that the restorations demonstrated a similar harmony and balance with the adjacent teeth, as well as with each other. These finishing steps also imparted realism by better defining line angles (eg mesial transitional line angle). In order to create a natural-looking final lustre, a one-step polishing system (Dimanto, VOCO) was used, which suited particularly well to the high surface hardness of new composite materials (Figure 15).

**CONCLUSION**

The case presented here has demonstrated the manner in which only two shades of a direct composite resin were used to produce imperceptible anterior Class IV restorations (Figures 16 and 17). With the development of new generation composites, the ability to recreate restorations with two composite colours, as opposed to three or more, while reproducing durable and aesthetically-pleasing characteristics contributes to our goal to provide less technique-sensitive treatment in biomimetic, conservative and effective ways.