Prefabricated veneers: A hybrid technique for easier (and more affordable) aesthetic results

Drs Rafael S. Beolchi & Wilton Forti
Brazil

Some time ago, the creation of direct composite restorations was a dream still to be achieved. Back then, composites lacked even some basic optical properties of teeth. By the end of the 1980s, this scenario changed as manufacturers of composite resins began to improve the materials’ optical properties. Composite resins started to be manufactured in a greater range of shades both for enamel and dentine and with enhanced optical properties.1,2

However, such a wide variety of shades can make it difficult for the dentist to make an accurate shade selection during the restorative procedure. Sadly, achieving lifelike results with a direct layering technique is only mastered by a few owing to its significant learning curve. This is especially true when it comes to the direct veneering of anterior teeth.

The veneering of anterior teeth was first proposed in 1937.3 Almost 40 years later, the technique was revisited, unsuccessfully, owing to an endodontic procedure (maxillary left central incisor) and a non-vital, discoloured tooth was re-treated, unsuccessfully, owing to its significant learning curve. This is especially true when it comes to the direct veneering of anterior teeth.

The aim of this article is to present a case in which six anterior prefabricated composite veneers were placed to achieve optimum aesthetic results.

Case report

A 58-year-old male patient with several aesthetic disorders in his anterior teeth presented for treatment for aesthetic purposes. Figure 1 depicts the situation before the treatment, showing large restorations with loss of natural tooth anatomy and colour, and a non-vital, discoloured tooth (maxillary left central incisor) owing to an endodontic procedure years ago.

The patient also wanted to resolve the diastemas. Another request from the patient was that the teeth not have an artificial appearance after treatment, in other words, that the final result blend with the natural dentition to resolve not only shape but also colour. In this case, this was particularly important, since his teeth presented a very rich colour shift: darker and more coloured in the cervical region and much more translucent and less colour in the incisal region. After various treatment options had been discussed, veneering the anterior teeth with a novel prefabricated composite veneer called Edelweiss (Ultradent) was selected. This system offers the clinician a one-visit alternative to directly placed composite veneers and is a good option compared with ceramic veneers, which were rejected by the patient for financial reasons.

The veneers are made from composite, but they undergo pressure and thermal temperisation during the fabrication process. This allows for very strong and thin veneers (facial surface around 0.5 mm, but thinner on the cervical and thicker on the incisal edge). They also pass through a laser vitrification process, through which a pure, inorganic glass surface, homogenous and smooth like a ceramic surface, is achieved, providing an excellent gloss.

First, the gingival tissues were displaced with a cord (Ultradent #9), and the preparation was done using diamond burs, but with a multipurpose contra-angle (kavo). Figure 2 shows the prepared teeth. As the veneers are relatively thin compared with indirect ones, it is possible to observe that almost all the preparation took place in the enamel, except for some portions of the cervical region, where it is possible to see some areas of exposed dentine. The preparation was less than 0.8 mm deep, which is more than enough for both the veneer and the composite. The Edelweiss system comes with a clear sizing guide for selecting the ideal veneer size.

From the image, it is possible to see that the selected veneers fitted quite well, but some adjustments with the margins were made, especially in the cervical region of the maxillary left central and lateral incisors. After proper etching and bonding of the tooth surface, the cementation was performed in pairs, beginning with both right and left central incisors, then right and left lateral incisors, and finally right and left canines. Amelogen Plus (Ultradent) was the composite used, and it was placed both directly on the tooth structure (a thin layer of shade A3) and at the back of the Edelweiss veneers. In order to achieve a natural colour transition, shades A4, A5, and A2, and a final translucent shade called Trans Gray were applied to the back of the veneers in waves, beginning with A4 in the cervical region and finishing with Trans Gray in the incisal region. The whole process proved to be faster and easier than what was initially expected. Composite colour adaptation in the interproximal areas was very good, and it was performed with an enamel colour called Enamel Neutral. The same colour was used in the cervical regions of the maxillary left central and lateral incisors, and blended very well with the veneers. The final result can be seen in Figure 4.

Figure 3 shows a close-up view of the gingival tissue 30 days after the procedure, from which proper healing is evident.

Conclusion

The rebirth of the prefabricated veneer concept now offers the clinician a one-visit, cost-effective alternative to directly placed composite veneers and is a good option compared with ceramic veneers. It is a reparative solution, and relatively economical and fast because there are no laboratory fees and no need for temporaries.

It also proved to be quick and simple to learn to use the system. New materials and advances in technology (dentine bonding, increased resin-filler ratio, and light curing, to name a few) allowed a rebirth of the concept of prefabricated veneering for the anterior teeth.4 The aim of this is to present a case in which six anterior prefabricated composite veneers were placed to achieve optimum aesthetic results.

References

1. New materials and advances in technology now allow for a resistant, vitreous, inorganic glossy surface that handles almost identically to composite. When it comes to veneering the anterior teeth, this solution offers both dentists and patients new and promising alternative.
ceramics. Another advantage is that e.max can be finished thinner without chipping owing to its higher edge strength. Additionally, e.max provides exceptional aesthetics without requiring a veneering ceramic when processed in its monolithic form. This allows restorations to maintain their structural integrity.

The material is available in four translucencies, including high opacity, medium opacity, low translucency, and high translucency.

In a five-year study conducted by Ivolar Vivadent, 97 per cent of the pressed e.max restorations studied received an excellent rating in aesthetics.

Research continues to examine the efficacy of lithium disilicate restorations. Fassinder et al., for example, investigated the longevity of lithium disilicate crowns, following 62 restorations over two years. The researchers found no identified cases of crown fracture or surface chipping.

Over the two-year period, the patients were checked three times and none reported any sign of sensitivity.

Guess et al. examined the fatigue behaviour and reliability of CAD/CAM-processed lithium disilicate compared with zirconia all-ceramic crowns veneered using the hand-laying technique. They concluded that the lithium disilicate configurations resulted in fatigue-resistant crowns compared with the zirconia crowns, which demonstrated a high susciptibility to early veneer failure.

Further, e.max can be used for a variety of indications, demonstrated by Sorensen et al., in whose study e.max was used for the fabrication of three-unit bridges. The researchers concluded that by using e.max they achieved an acceptable clinical success rate.

Other indications include posterior partial and full-crown, as well as implant-supported restorations.

Case studies
IPS e.max can be used for a wide range of universal anterior and posterior indications. Patients with concerns regarding aesthetics are pleased after receiving their restorations, and clinicians can be assured of functional predictability.

Pos terior restorations fabricated from e.max demonstrate the requisite strength, aesthetics, and durability. Whether full or partial coverage, e.max restorations provide function and fit to ensure satisfaction of both clinician and patient. The following cases demonstrate the material’s versatility for a number of everyday restorative cases.

Case 1
The patient presented with three non-vital maxillary anterior teeth and had concerns regarding her aesthetics (Fig. 1a). Three anterior full-crown all-ceramic restorations were fabricated from e.max in order to enhance aesthetics and function, and were cemented with Multilink N adhesive cement (Fig. 1b).

Case 2
A patient presented with failing ceramic veneers in the maxillary anterior region and concerns about the aesthetics of her smile (Fig. 2a). Owing to significant tooth decay, the teeth were prepared for full coverage restorations (Fig. 2b). Four e.max restorations were fabricated to establish an enhanced aesthetic appearance for the patient and cemented with Variolink N adhesive cement (Fig. 2c).

The lithium disilicate material absorbs and reflects light in a similar manner to natural teeth. The wide variety of options for brightening the restorations enabled the clinician to meet the patient’s expectations.

Case 3
A female patient presented with worn dentition, a closed vertical dimension of occlusion, and poor occlusion, particularly on the left side (Fig. 3a). She expressed great concern about what she perceived as unacceptable aesthetics. The teeth were prepared for full coverage restorations owing to the extensive fillings and need to change her occlusion and vertical dimension of occlusion radically (Fig. 3b). All of the maxillary teeth were restored with full-crown restorations fabricated with e.max.

This material was selected based on its strength and durability, which would be necessary to establish a new and comfortable occlusion and desirable aesthetic outcome (Fig. 3c).

Case 4
The patient presented with maxillary decay on a maxillary molar (Figs. 4a & b). A minimally invasive mesial-occlusal inlay preparation was performed in anticipation of using e.max (Fig. 4a).

The preparation maintained the enamel on all of the peripheral margins. The mesial-occlusal inlay was placed and adhesively bonded to the enamel along all of the margins (Fig. 4d). Once placed, superior aesthetics and marginal fit were confirmed.

The lithium disilicate restoration decreased the flexure of the tooth dramatically, which possibly decreased the risk of future failure.

Case 5
A patient presented with significant mesial-occlusal decay of a maxillary first molar (Figs. 5a & b). The tooth preparation was performed for an onlay fabricated from e.max by hollow grinding the internal aspects of the tooth and finishing all of the margins on the enamel.

The onlay was adhesively bonded entirely to the enamel with Multilink N cement (Fig. 5c).

This procedure was minimally invasive, and the ceramic material provided a successful longterm result.

Case 6
The patient presented needing an implant abutment. A stock titanium abutment (Bio-Horizons) was placed, and a ceramic core cemented on to the mandibular right second molar (Fig. 6a). The individual e.max restorations were fabricated and demonstrated superior aesthetics and occlusion compared with the patient’s previous treatment (Fig. 6b).

Case 7
A patient presented needing an implant that is easier to realise a more functional and aesthetic reconstruction. By using lithium disilicate principally as a monolithic material in this case, the laboratory time to fabricate these restorations was two-thirds less than when a metal core is made and a ceramic layered over it (Fig. 7).

Conclusion
I have maintained a database for the last 50 years of different confounding variables and papers on the long-term survival rates of ceramic materials and the conditions that promote failure. Previously, the best longterm survival of a restoration that has been studied was the monolithic leucite-reinforced glass-ceramic (IPS Empress, Ivolar Vivadent).

It has been demonstrated that e.max can be used universally and effectively in all areas of the mouth, including the posterior region, making it suitable for a range of indications.

It has been studied repeatedly to confirm its strength and functionality, and my research confirms that lithium disilicate has been used with impressive longterm success.

A list of references is available from the publisher.

Contact Info
Dr Kenneth Malament maintains a full time practice limited to prosthodontics in Boston, MA, USA. He can be contacted at ken.malament@verizon.net.