Achieving lifelike tooth aesthetics with direct veneers from Ivoclar Vivadent’s Tetric N-Collection

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Direct additive procedures with bonded resin composites are considered the most conservative and least invasive technique to restore missing, damaged and unsightly tooth structure to enhanced colour, form and function in the aesthetic zone. However, the creation of natural-looking restorations can be quite a challenge for the clinician. For complex anterior composite restorations, the clinician must have a comprehensive understanding of the colour, translucency and morphology of natural teeth, as well as of materials science and the restorative techniques involved.

Nowadays, nano-hybrid composites provide improved strength, wear resistance, handling properties and surface characteristics. However, it remains to be determined whether their optical properties can ideally mimic natural tooth tissue, a prerequisite for restorations that are invisible to the human eye at a speaking distance.

A 29-year-old male patient presented to our practice requesting treatment for his smile (Fig. 1). Initial situation: unsatisfactory smile with multiple carious lesions, discoloured composite restorations and abraded areas (Fig. 2). The patient wished to have the discoloured restorations replaced and to have the correct length and golden ratio proportions according to the patient’s existing dentition (Fig. 3). The Bleach I shade (Ivoclar Vivadent) shows a translucency (20 per cent) and allows light to pass through the structure and the projected outline of the teeth became apparent with the silicone key in place (Fig. 10).

Composite stratification
The overall goal was to rejuvenate the patient’s smile not only in terms of tooth contours but also in terms of a natural colour gradient and different translucency levels. The incisal edges of younger, unabraded teeth often show a high level of opalescence. The goal in this clinical situation was to reproduce this effect. Hence, a translucent flowable composite (Tetric N-Flow, shade Bleach I, Ivoclar Vivadent) was applied with the silicone key in place. It was spread to a thin layer with a dental probe (Fig. 11) and light cured for 10 seconds.

The Bleach I shade shows a much higher degree of translucency (20 per cent) compared with standard enamel shades (15 to 15 per cent) and allows light to pass through the composite. These thin enamel shells are highly opalescent and show the characteristic halo effect around the incisal edges (Fig. 12).

The existing dentine defects and the dentine cores were built up by application of a translucent flowable composite, spread to a thin layer—Fig. 11. Thin, translucent and opalescent enamel shells with the characteristic halo effect.

Fig. 1: Initial situation: unsatisfactory smile with multiple carious lesions, discoloured composite restorations and abraded areas. Fig. 2: Wax-up of the new smile on the plaster model with the silicone key in position. Fig. 3: Shade selection with the Tetric N shade guide; lips and cheeks retracted with OptraGate. Fig. 4: Details of both central incisors prepared with a diamond-coated wax bur (Fig. 5).—Fig. 6: Additional space gained for the lateral incisors to correct tooth proportions. Fig. 7: Minimally invasive veneer preparation with a round-ended tapered diamond bur (Fig. 8) results in a supragingival chamfer preparation design (b).—Fig. 9: Differential etching of the enamel and dentine surfaces with 35% phosphoric acid gel. Fig. 10: Precise and economical application of Tetric N-Bond using the VirtualPen.—Fig. 11: Application of a translucent flowable composite, spread to a thin layer—Fig. 12: Thin, translucent and opalescent enamel shells with the characteristic halo effect.

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Smile design in the anterior zone

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the depth of the restoration, of the dentine core. Therefore, through adequate thickness restorations with sufficient chromatic importance to impart all the shade Dentin B2). It was of utmost composite material (Tetric N-Ceram, opaque, highly chromatic composites with natural light reflection. (Fig. 13)

In order to create a natural colour gradient, a small amount of a darker opaque flowable dentine material with a high chroma (Tetric N-Flow, shade Dentin A3.5) was applied to the cervical aspects of the teeth (Fig. 14). In order to further enhance the opalescence of teeth 12, 11, 21 and 22, additional opalescent composite (Tetric N-Ceram, shade Bleach I) was applied to the incisal third of the central and lateral incisors in thin layers.

By applying miniscule scattered amounts of a light-curing white stain (Tetric Color, white, Ivoclar Vivadent), the illusion of discreet whitish opaque areas of hypoplastic enamel was created within the incisal edge. A medium-translucency enamel shade (Tetric N-Ceram, shade B2) was applied to build up all of the teeth to full contour with natural emergence profiles. In order to conclude the composite stratification, proximal vertical ridges and embrasures were shaped with a non-stick disposable chisel tip (OpturaSculpt, Ivoclar Vivadent, (Fig. 15).

Tetric N-Ceram was easily sculpted and showed excellent stability after application prior to light curing.

Finishing and polishing

For natural light reflection, the anatomically layered surface was refined using a fine-grit diamond finishing bur at low speed and without a water spray. This enabled perfect visual control and reduced the risk of excessive removal of composite material. In order to create a homogenous and smooth surface, another dry finishing step was performed with an abrasive silicon carbide-containing rubber polisher (Astropol F, Ivoclar Vivadent) at slow speed. At this stage, a silky surface lustre started to emerge. Anatomical surface characteristics, such as vertical grooves, can be further enhanced under good visual control. Subsequently, all composite surfaces were wet polished at high speed (Fig. 16) to achieve a glossy surface lustre (Astropol HP, Ivoclar Vivadent). Generally, for finishing and polishing aesthetic anterior composite restorations, the best results are achieved with multistep polishing systems.

The patient was recalled two weeks after treatment. With the tooth proportions and shapes corrected, the patient’s smile was now in harmony with the lips and face (Fig. 17). A close-up photograph of the patient’s smile revealed a pronounced lifelike opalescence, characterisations and a halo effect (Fig. 18). The lateral view displayed natural light reflections from the highly polished macro- and micro-anatomically shaped composite surfaces (Fig. 19).

As an alternative to the treatment described here, all-ceramic veneers (e.g. IPS e.max, Ivoclar Vivadent) would have been a viable aesthetic and durable treatment option, mainly owing to their less invasive nature compared with all-ceramic crowns. Unfortunately, the cost of all-ceramic veneers is substantially higher than any kind of direct resin restoration. Since the patient expressed serious financial concerns, ceramic veneers were not pursued.

In this clinical case, direct adhesive composite restorations were the preferred option. They are also a very conservative treatment modality because any tooth preparation was strictly limited to the purpose of generating retentive surfaces. Moreover, in the case of future fractures or chipping, composite veneers can be repaired much more easily and predictably than ceramic veneers. This can be an advantage for patients conscious of cost.

Conclusion

The selection of a suitable composite material with optical properties that ideally mimic natural tooth tissue is a key factor in creating restorations that blend well with the remaining tooth structure and are invisible to the human eye. In the clinical case described here, the universal composite system Tetric N-Collection was used for the build-up of the patient’s anterior teeth. The combination of opaque dentine shades with high-chroma, medium-translucency enamel shades and highly translucent enamel shades with natural opalescence yielded a predictable and aesthetic outcome in terms of colour saturation, translucency and opalescence.

In addition, the material features finely tuned filler technology, which imparts favourable polishing properties that result in a high surface gloss. Tetric N-Collection has proved to be a universal composite system with great aesthetic potential and, therefore, also suitable for aesthetically challenging cases in the anterior dentition.