Trends & Applications

Maintain aesthetics within simplified prosthetic treatment processes

Explaining the use of a bulk-fill composite in combination with a monolithic ceramic

In the past several years, the range of restorative materials available for dentists and dental technicians has increased remarkably. New technologies have made treatment processes more efficient and enabled dental professionals to fabricate reproducible and predictable restorations that blend into the natural oral environment harmoniously.

In direct restorative treatment with composite materials, the increment technique has so far been the gold standard. This technique requires applying the material in thin layers and curing these increments individually. Consequently, it is relatively time-consuming to place restorations. Quality issues also often arise, such as air bubbles between the layers, for example. The increased risk of contamination of the materials can also compromise the quality of the restorations.

Some manufacturers, however, offer composites that can be placed in the cavity in large (bulk) increments. Tetric N-Ceram Bulk Fill (Ivoclar Vivadent), for example, can be cured in layers of up to 4 mm thick. Similar significant and practical developments in the ceramic restorative materials sector have also contributed to the advancements in restorative dentistry. Thanks to the CAD/CAM processing technology, subtractive methods are increasingly replacing conventional additive procedures, such as the layering technique. The fabricated restorations are able to withstand strong masticatory forces owing to their very high stability. At the same time, they fulfil the aesthetic requirements of different clinical situations.

The digitisation of various processes ensures not only high-quality but also reproducible outcomes. The following clinical case demonstrates that an aesthetic result can easily be achieved using a bulk-fill composite in combination with a CAD/CAM ceramic restoration.

**Patient case**

A 19-year-old female patient presented to our clinic for the restoration of her osseointegrated implant in region 14 (Figs. 1 & 2). The implant had been exposed and a mesial carious lesion was observed in the adjacent premolar (Fig. 3). In a first treatment step, a local anaesthetic was administered, the caries removed and a clean cavity prepared. A rubber dam was placed to prevent any contamination of the working area with saliva during the restorative treatment (Fig. 4).

Then, the cavity was filled with only one layer of bulk-fill composite (Tetric N-Ceram Bulk Fill) using an LED polymerisation device (Fig. 7). After removal of the matrix, the cavity was fulfilled aesthetically. The completed composite restoration in tooth 15 (mesial) was ideal to take an impression of the situation (Fig. 5).

The maximum depth was 4 mm, a perfect indication for Tetric N-Ceram Bulk Fill (Fig. 5), which would allow us to fill the cavity in only one layering step. After placement of a matrix band, the adhesive was applied (Fig. 6). The cavity was filled with only one layer of bulk-fill composite (Tetric N-Ceram Bulk Fill), which would allow us to fill the cavity in only one layering step.

The matrix was placed and the cavity was prepared for the restorative procedural. A primer was applied to the cavity, rubbed in for 15 seconds and allowed to react for another 15 seconds. Then, the bonding agent was applied (Fig. 6), dispersed with a stream of air and cured with an LED polymerisation device (Fig. 7). The cavity was filled with the bulk-fill composite (Tetric N-Ceram Bulk Fill) using only a single layer (Fig. 7). After removal of the matrix, the composite restoration in tooth 15 (mesial) was ideal to take an impression of the situation (Fig. 5).

After treatment, the patient was pleased with the aesthetic result and the time required for the treatment was significantly reduced compared to conventional restorative procedures.
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Composite was light cured, finished and polished as usual (Fig. 8).

Tooth 14 was finally prosthetically restored. Two weeks after the exposure of the implant, an impression of the dental situation was taken (Fig. 9) and an individualised hybrid abutment was planned to provide the basis of the restoration. For this purpose, an abutment was modelled, pressed (IPS e.max Press, Ivoclar Vivadent, HO) and then adhesively cemented to a titanium base (Multilink Implant, Ivoclar Vivadent). During the try-in of the abutment, the cervical margin and the emergence profile were examined (Fig. 10). Since no additional adjustments were required, the crown was fabricated (IPS e.max CAD, Ivoclar Vivadent, LT A2) and caracterised with stains (Fig. 11). In the permanent cementation of the crown to the abutment, retraction cords were used to minimise the occurrence of excess luting material in the gingival area, as well as to allow the easy and safe removal of excess material after curing if required (Figs. 12 & 13).

Conclusion

The ongoing development of dental materials and processing techniques has greatly affected and changed restorative dentistry. Tetric N-Ceram Bulk Fill, which is light cured in 4 mm layers, simplifies direct restorative filling therapy with chairside composites. IPS e.max CAD, which is processed using CAD/CAM technology, renders the fabrication of restorations efficient. Furthermore, individualised ceramic layering is no longer required for certain indications.

In this case, the implant in the position of tooth 14 was restored with an all-ceramic restoration. Tooth 15 was restored with a composite filling (Fig. 14).

Although this indication does not seem to be as demanding as anterior restorations, patients expect natural-looking results nevertheless (Fig. 11). Therefore, both dentists and patients desire a simple and efficient procedure that will produce aesthetic results.