

Ceramic materials and composites provide an esthetic solution

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In the past few 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 which harmoniously blend into the natural oral environment. 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 and quality issues easily occur. For

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example, air bubbles between the layers and an increased risk of contamination of the materials can compromise the quality of the restorations. Today, however, some manufacturers offer composites which can be placed in the cavity in large (bulk) increments. Tetric® NCeram Bulk Fill, for example, can be cured in layers of up to 4mm.

Similarly significant and practical developments in the ceramic restorative materials sector have also contributed to the advancements in restorative dentistry over recent years. Thanks to the CAD/CAM processing technology, subtractive methods are increasingly replacing conventional “additive” procedures (layering technique). The fabricated restorations are able to withstand strong masticatory forces due to their very high stability and they fulfil the esthetic requirements of different clinical situations at the same time. Furthermore, the digitization of various processes ensures not only high-quality but also reproducible outcomes. The following clinical case demonstrates how an esthetic result is easily achieved using a bulk fill composite and a CAD/CAM-fabricated ceramic restoration.



Figures 1 and 2: Starting situation: osseointegrated implant in the premolar region.



Figure 3: During exposure of the implant, a mesial caries lesion was noticed in the adjacent premolar.

Patient case

A 19-year-old female patient presented to our clinic in order for us to restore her osseointegrated implant at tooth 14 (Figs 1 and 2). After exposure of the implant, a mesial caries lesion was noticed in the adjacent premolar (Fig. 3). In a first treatment step, a local anaesthetic was administered, the caries removed and a clean cavity prepared. Subsequently, a rubber dam was placed in order to prevent any contamination of the working area with saliva during the restorative treatment (Fig. 4). Then, the cavity dimensions were measured using a probe. The maximum depth was 4mm – a perfect indication for Tetric N-Ceram Bulk Fill (Fig. 5), which would allow us to fill the cavity in only one layering step. Next, the matrix was placed and the cavity was



Figure 4: Caries in tooth 15 was removed and a rubber dam was placed in preparation for the restorative treatment.



Figure 5: The measuring results produced with a periodontal probe showed a cavity depth of 4 mm.



Figure 6: After the placement of a matrix band, the adhesive was applied.



Figure 7: The cavity was filled with only one layer of bulk fill composite (Tetric N-Ceram Bulk Fill).



Figure 8: The completed composite restoration in tooth 15 (mesial).



Figure 9: Two weeks after the implant exposure the time was ideal to take an impression of the situation.



Figure 10: Try-in of the hybrid abutment.

prepared for the restorative procedure. Therefore, a primer (AdheSE®) was applied to the cavity, rubbed in for 15 seconds and allowed to react for another 15 seconds. Subsequently, the bonding agent was applied (Fig. 6), dispersed with a stream of air and cured with an LED polymerization device (Bluephase® 20i, LOW mode) for 10 seconds. Finally, the cavity was filled with the bulk fill composite (Tetric N-Ceram Bulk Fill, IVB) using only a single layer (Fig. 7).

After removal of the matrix, the composite was light-cured, finished and polished as usual (Fig. 8).

In a next step, tooth 14 was prosthetically restored. Two weeks after the exposure of the implant, an impression of the dental situation was taken (Fig. 9). An individualized hybrid abutment was planned to provide the basis of the restoration. For this purpose, an abutment was modelled, pressed (IPS e.max® Press, HO) and then adhesively

cemented on a titanium base (Multilink® Implant). During the try-in of the abutment, the cervical margin and the emergence profile were examined (Fig. 10). As no additional adjustments were required, the crown was fabricated (IPS e.max CAD, LT A2) and characterized with stains (Fig. 11). In the permanent cementation of the crown on the abutment, retraction cords were used to minimize the occurrence of excess luting material in the gingival area and to easily and safely remove excess material after curing, if required (Figs 12 and 13).

Conclusion

The further 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



Figure 11: The abutment cemented on the titanium base and the completed crown (IPS e.max CAD).



Figures 12 and 13: After the placement of the abutment, the all-ceramic crown was permanently luted in the oral cavity.



Figure 14: Occlusal view after the insertion of the crown.



Figure 15: Labial view. The implant crown smoothly blends into the natural dentition. Similarly, the composite restoration is hardly visible with bare eyes.

CAD/CAM technology, renders the fabrication of restorations very efficient. Furthermore, individualized ceramic layering is no longer required for certain indications. In the presented case, the implant in the position of tooth 14 was restored with an all-ceramic restoration and premolar 15 was restored with a composite filling (Fig. 14). Although this indication does not

seem to be as demanding as anterior restorations, patients nevertheless expect natural-looking results (Fig. 15). Therefore, both dentists and patients desire a simple and efficient procedure, which will produce esthetic results.

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