

# Restoration of occlusal cavities in the posterior dentition using an ormocer-based material

Sanzio Marques<sup>1</sup>

## Introduction

Tooth-coloured restorations with composites in the posterior region have now become a standard feature of modern dentistry, as more and more patients express a desire for a restoration which blends in with their natural dentition. Due to the high occlusal loads exerted on the posterior teeth, the selection of strong materials is imperative. For this reason, the composition of composites has evolved significantly and positively in recent years, to the benefit of their physical properties above all.

Adhesive techniques offer additional advantages, with the preservation of the remaining dental hard tissue deserving particular mention. Cavity preparations are no longer restricted solely to geometric models focusing on biomechanical principles. Direct restorations with composites are bonded to the tooth substance, and therefore the aim is only to remove caries and existing restorations selectively and to smooth the borders of the cavity. This means that the teeth are not only weakened less, but are actually strengthened by the fabrication of the adhesive fillings.

Placement of adhesive fillings is technique-sensitive. It is important to ensure compliance with the rules of these techniques so as to avoid microleakage and hypersensitivities in particular. If these requirements are satisfied, composite fillings are considerably superior to amalgam fillings, for example, due to their high quality and good aesthetics.

A material launched on the market in recent years with the indication for restorations in the posterior region is the ORMOCER<sup>®</sup> (organically modified ceramic). It consists of organic/inorganic hybrid polymers, and its properties include very low shrinkage, excellent biocompatibility and outstanding aesthetics.

## Description of clinical case

A patient presented at our dental practice with the desire to have the amalgam fillings in teeth 46 and 47 (lower right first and second molars) replaced for aesthetic reasons (Fig. 1). Aesthetic restorations with the nanohybrid ORMOCER<sup>®</sup> restorative material Admira Fusion (VOCO) were indicated.



Figure 1: Teeth 46 and 47 with amalgam fillings to be replaced for aesthetic reasons.



Figure 2: Isolation with rubber dam.

<sup>1</sup> Dr Sanzio Marques, Brazil



Figure 3: Prepared class I cavities.



Figure 4: Application of Futurabond DC (VOCO) adhesive system.

After isolation with a rubber dam (Fig. 2), the amalgam fillings were removed and the cavity preparation performed (Fig. 3).

The Futurabond DC (VOCO) adhesive system was massaged in for around 20 seconds (Fig. 4) and the solvent then removed with a stream of air. The adhesive was lightcured for 10 seconds (Fig. 5).

As the cavities were small and shallow and Admira Fusion has a low degree of polymerization shrinkage, the cavities were each restored with a single increment (Fig. 6). A spatula was used to remove the excess material and



Figure 5: Light-curing of adhesive layer for 10 seconds.



Figures 6, 7, 8 and 9: Cavities were each restored with a single increment. The occlusal surfaces were sculpted with fine spatulas and probes, without intermediate curing of these increments. The restorations were then cured for 20 seconds each.



Figure 10: A fine probe was used to sculpt occlusal fissures.



Figure 11: Characterisation of the fissures was performed with a brown composite shade to create accents and the impression of depth.



Figure 12 & 13: Restorations before finishing and polishing.



Figures 14, 15, 16, 17 & 18: Finishing and polishing of the restoration with successive use of diamond-coated rubber polishers, goat's hair brushes with diamond compound, silicon carbide brushes and felt polishers.

## MARQUES

perform initial sculpting of the anatomical shape of the tooth (Fig. 7 and 8). The top layer was smoothed with a brush to facilitate the finishing and polishing.

A fine probe was used to shape the occlusal fissures prior to curing the ORMOCER® restorative material (Fig. 9 and Fig. 10). The restoration was light-cured for 20 seconds. The fissures were then characterised with a composite shade (FinalTouch from VOCO) (Fig. 11) and cured for 20 seconds before a final layer of composite was applied. The restoration was then cured for a further 20 seconds.

Even before the rubber dam was removed, the satisfactory morphological characteristics of the restorations were already clearly visible (Fig. 12 and 13).

The finishing and polishing were performed with abrasive, diamond-coated rubber polishers, brushes and felt polishers (Fig. 14, 15, 16, 17 and 18).

The patient was extremely pleased with the finished results, which can be seen in Fig. 19, 20 and 21.

### Conclusion

The nanohybrid ORMOCER® restorative material Admira Fusion proved an excellent choice. It is easy to use and can be sculpted and polished optimally. The described technique was relatively simple and even the use of just one shade of material proved sufficient to satisfy the aesthetic requirements when placing a restoration in the posterior region.



Figure 19 & 20: Finished restorations with harmony between aesthetics and function.



Figure 21: Once finished, the fillings displayed homogeneous occlusal contacts.