



Anterior tooth restoration with innovative ORMOCER® technology

A clinical case report

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The aim is uncomplicated, functional, and aesthetically-pleasing results, thanks to direct restorations. The patient's wishes must be taken into account accordingly, within the framework of cost efficiency. With the innovative ORMOCER® Admira Fusion 5, highly aesthetic results can be achieved with only 5 cluster shades, thanks to optimised light scattering. Biocompatibility is excellent due to the fact there aren't any monomers.

The specific case

A 48-year-old female patient with multiple allergies and a history of epileptic seizures appeared with the wish for a quickly designed and aesthetic replacement restoration of tooth 21, after an accident involving this tooth was first treated 10 years ago (Fig. 1). In addition to an analogue or digital prosthetic solution, restoration using a composite or ORMOCER® was discussed with the patient. Taking into account the underlying diseases, the method of relative drainage was decided upon. The direct preservative restoration with Admira Fusion 5 (VOCO GmbH, Germany) has proved to be a suitable solution, as it does not contain any classic monomers. The patient's wish for an aesthetically-pleasing restoration within the shortest possible treatment time could be realised through the enhanced chameleon effect.

Findings and diagnosis

Clinically, tooth 21 showed an inadequate filling with discolouration at the restoration margin with marginal gap formation. The sensitive tooth had a degree of loosening I with percussion insensitivity, periodontal damage was not present.

Treatment

Tooth shade A2 was selected according to the cluster-shade system (Fig. 2). First, an impression of the situation was made using V-Posil Putty Fast (VOCO GmbH, Germany) to create a plaster model. An individual silicone key was made with Registrado Clear (VOCO GmbH, Germany) to build up the palatal surface (Fig. 3).

Local infiltration anaesthesia was performed with Ultracain D without adrenaline (Sanovi-Aventis GmbH, Germany), after which the anterior teeth were cleaned using a fluoride-free prophylaxis paste Cleanic (KERR GmbH, Germany). The existing inadequate filling was removed under moisture control with diamond and rose burs (Fig. 4).

The tooth was prepared according to the rules of the adhesive technique with angled enamel margins while protecting the dental hard tissue. Afterwards, the total-etch technique was used. The 35% phosphoric acid Vococid (VOCO GmbH, Germany) was then applied to the enamel for approx. 15 seconds, and then to the dentin for a further 15 seconds (Fig. 5).

The phosphoric acid and dissolved components were sprayed for 20 seconds with a mixture of air and water. The cavity was then dried with an air jet (Fig. 6).

Admira Bond (VOCO GmbH, Germany) was used to achieve high bond strength values for a restoration free of marginal deficiencies. It was evenly rubbed into the enamel and dentine regions with a microbrush for 30 seconds (Fig. 7). The bonding agent was dried with a weak air stream and then light-cured for 20 seconds with the curing light.

Before Admira Fusion 5 was applied, the full-surface coating with Admira Bond was controlled by an even gloss. Matt and exposed surfaces should always be selectively re-bonded to avoid postoperative hypersensitivity.

The silicone impression was adapted for shaping (Fig. 8). The excellent plasticity of Admira Fusion 5 allow for precise shaping. This means further anatomical modelling on the palatal wall could be simplified. A wedged translucent matrix was used as a shaping aid for the approximal areas. Only Admira Fusion 5 Cluster Shade A2 was used and the material was applied in 2mm increments. Light curing was performed in a cost-effective way using a polymerisation device (1200 mW/cm²) for 10 seconds per increment, with the light aperture positioned as close as possible to the filling surface to ensure optimal curing.

Once the filling had been completely placed, the shape and surface of the restoration was checked and then the application continued. This was initially done with rotating diamond burs (red and yellow ring, Fig. 10). Afterwards, pre-polishing was carried out with highly flexible polishing wheels and strips with coarse to extra-fine grit size (Super-Snap, SHOFU Dental GmbH, Germany) while checking the occlusion and articulation with Hanel Shimstock foil (Coltene Whaledent AG, Switzerland) (Fig. 11).

The high gloss polishing was done with Dimanto polishers (VOCO GmbH, Germany) at a speed of 5000 rpm under water cooling and reduced contact pressure. Finally, the restoration was treated with CleanJoy fine polishing paste (VOCO GmbH, Germany) (Fig. 12).

Result

The patient is extremely satisfied with the result of the restoration (Fig. 13). At the beginning of treatment, a inadequate, discoloured filling was found in tooth 21. The patient's underlying disease required a fast yet aesthetic anterior tooth restoration, which was achieved using the Admira Fusion 5 cluster system with only one shade and no complex layering. After high gloss polishing and fluoridation with Bifluorid 10 (VOCO GmbH, Germany), an individual natural appearance is the result.

Discussion

The patient wanted a quick, cost-effective, yet aesthetically-pleasing restoration of tooth 21. In order to protect the dental hard structure, a prosthetic restoration should be avoided in favour of a composite/ORMOCER® system.

Determining the correct tooth shade is indispensable for an aesthetic result and is not always an easy task in everyday

practice. Various factors such as prefabricated shade guides with a limited colour spectrum, individual lighting conditions, perception of the eye, and a variety of colour gradients within the dental hard tissue have a decisive influence on the choice of shade. With Admira Fusion 5, we have succeeded in developing a purely ceramic-based ORMOCER® that requires only 5 cluster colours, each of which combines several Vita colours. The material is suitable for both anterior and posterior aesthetics. This is possible by specifically adapting the resin matrix to the size and visual properties of the nano-hybrid particles, whereby optimised light scattering causes an enhanced chameleon effect. By changing the light scattering, the polymerisation time could be significantly reduced at the same time.

The plasticity is excellent; the material can be adapted smoothly with low adhesiveness on the instrument. The low shrinkage (1.25 vol.%) and simultaneous low shrinkage stress result in excellent strength and colour stability for optimal marginal integrity. A high gloss polishing is quick and easy to achieve.

The dentist is offered a modern restorative material, which significantly simplifies day-to-day practice.

Conclusion

The patient was very satisfied with the result of the restoration. Despite the large defect, spending a lot of time and costly measures could be avoided in comparison to an indirect treatment. If the requirements for adhesive dentistry are met, long-term patient satisfaction can be expected from the long-term success due to the excellent physical and aesthetic properties of the material. The new Admira Fusion 5 is particularly recommendable, in the author's opinion, because of increasing economic pressure and cost-intensive treatments that demand fast, high-quality, and reliable treatments. The cost/benefit comparison is clearly in favour of the benefits due to time and material savings; only 5 colours are necessary and must be kept in stock accordingly.

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Fig. 01: Initial clinical situation with inadequate restoration



Fig. 02: Easy shade identification

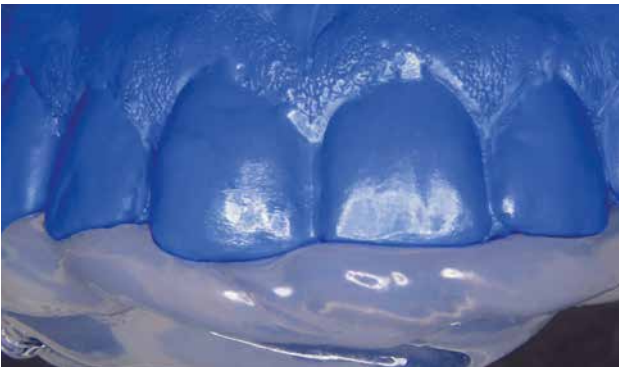


Fig. 03: Making the silicone impression



Fig. 04: Removed restoration



Fig. 05: Selective etching technique in enamel



Fig. 06: Etched cavity prior to adhesive application



Fig. 07: Bonding agent application with microbrush



Fig. 08: Applied silicone impression



Fig. 09: Moulded restoration



Fig. 10: Diamond processing



Fig. 11: Contouring with polishing wheel



Fig. 12: Final polishing of the restoration



Fig. 13: Final restoration with Admira Fusion 5