

Placement of Posterior Restoration Using a Flowable Composite Material: G-aenial Universal Flo

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Nowadays, composite resin materials are the most used aesthetic materials for restoration of hard dental tissues. They are composed of three basic components: organic resin-based matrix, anorganic fillers and coupling agent, added with colour-stabilising agent, inhibitors of polymerisation, pigments, and initiators of polymerisation. The characteristics of these materials have been improved since their introduction into dental practice. By adding nanoparticles of anorganic fillers, their strength, hardness, resistance to wear and elasticity have been increased, with lower moduli of thermal expansion and polymerisation stress, as well as better aesthetics.

Flowable composite materials were developed by decreasing the anorganic part in composite resin materials and/or increasing the content of monomers, which facilitates their application.² Major advantages of flowable composite materials are their adaptation to cavity margins, especially in cases of tunnel preparation and narrow isthmus. Flowable composites are more elastic in comparison to microhybrid and nano-composite materials, therefore producing less stress on the cavity walls. However, flowable composite materials have lower physical and mechanical properties in comparison to conventional composites. According to Bayne et al.,³ the first generation of flowable composite materials exhibits higher polymerisation shrinkage in comparison to conventional composite materials, which is due to the less anorganic part in its composition. Recently, a new composite material, *G-aenial Universal Flo* (GC, Tokyo, Japan) was introduced on the market. This material can be used alone for restoration due to improved physical, mechanical and optical properties. The anorganic part of the material is made of strontium glass particles 200nm in size, which is, until today, the smallest size of particles added to flowable composite materials. Using nano-sized anorganic particles, the content of the anorganic part in the material is increased, filler particles are uniformly dispersed in the organic matrix and the space between the particles are reduced, which reinforces and protects the organic matrix.^{4,5,6} The adhesion between the anorganic and organic parts is improved, as well as its elasticity and saturation of colour. Furthermore, the material can be excellently polished.^{7,8} *G-aenial Universal Flo* is a thixotropic material that stays in place after application, unlike other flowable composites. This characteristic is especially desirable when restoring anterior teeth and the cervical areas of teeth. It is available in 15 different shades: standard (A1, A2, A3,

A3.5, A4, B1, B2, B3, C3, BW, CV), outside (AE, JE) and inside colours (AO2, AO3).

Case report

A 25-year-old patient came to the Department of Endodontics and Restorative Dentistry – School of Dental Medicine in Zagreb for replacement of an amalgam filling on the lower left first molar (tooth #36, Figure 1). A marginal gap was found during



Fig. 1. Amalgam restoration on tooth 36.

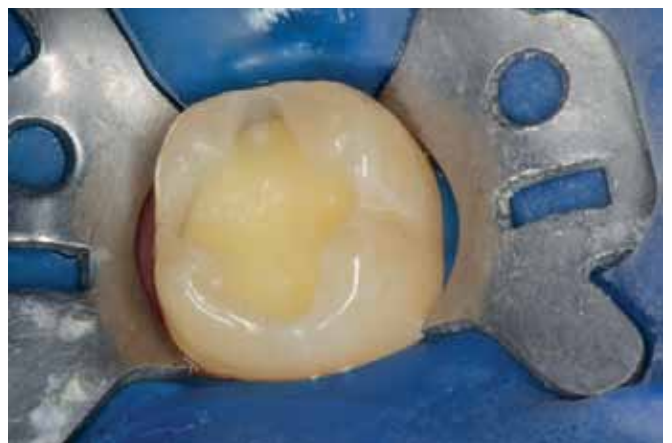


Fig. 2. Tooth #36 after removal of the amalgam filling and finishing of the enamel margins.

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clinical examination of the restoration. After local anaesthesia was administered, the old amalgam filling and soft, carious dentin were removed. After finishing the enamel margins (Figure 2), the tooth was isolated using a rubber dam. Before placement of the composite restoration, the enamel was etched with 37 per cent orthophosphoric acid for 10 seconds (Figure 3). After rinsing and drying the cavity, the self-etching adhesive of

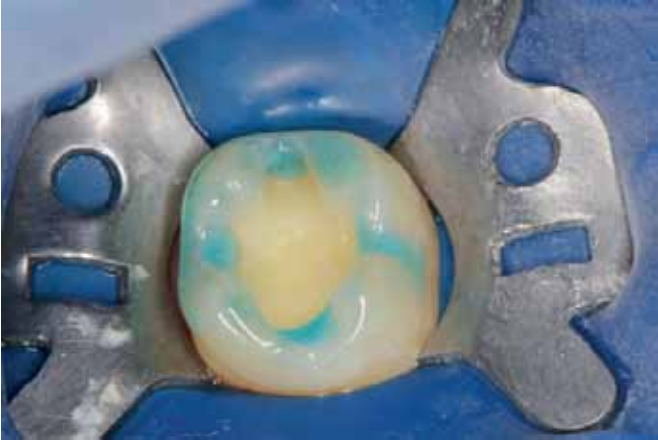


Fig. 3. Etching of the enamel.

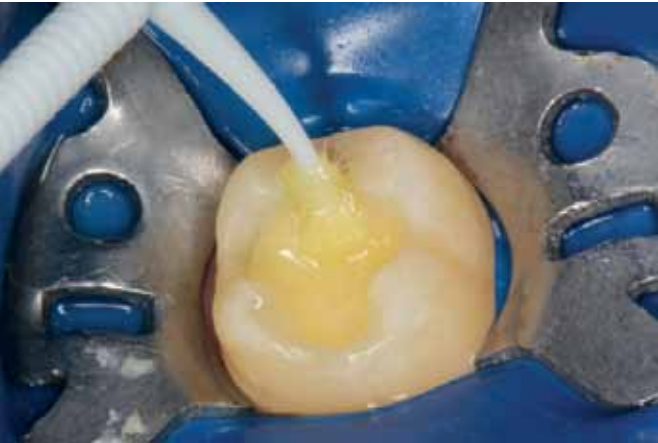


Fig. 4. Placement of the adhesive.



Fig. 5. Adhesive G-aenial Bond.

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Fig. 6. Polymerisation of the adhesive.

Fig. 7. G-aenial Universal Flo.



Fig. 8. Placement of the G-aenial Universal Flo into the cavity.



Fig. 9. Final appearance of the restoration after finishing and polishing.

Fig. 10. Recall after six months.

seventh generation G-aenial Bond (GC, Tokyo, Japan) was used (Figure 4). This self-etching adhesive contains phosphoric ester monomer and 4-MET as G-Bond but with a lower pH (Figure 5). Adhesive was applied in one layer and left for 10 seconds, after which it was air-blown for 5 seconds and polymerised for 10 seconds (Figure 6).

G-aenial Universal Flo (Shade A2, Figure 7) was used for the restoration because of its good adherence to cavity walls. The material was placed in the cavity in 2mm-thick layers with the special tip, which facilitates application of the material (Figure 8). Every layer was polymerised for 20 seconds. Before final light polymerisation, excess material was removed.

The restoration was finished with diamond drills in order to achieve the occlusal morphology. Polishing was done using rubbers and brushes with polishing paste. Figure 9 shows the final result, while Figure 10 shows the restoration after six months. **DA**

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About the Author



Ivana Miletić, DMD, PhD graduated at the School of Dental Medicine, University of Zagreb in 1995. Since then, Dr. Miletić has been working at the Department of Endodontics and Restorative Dentistry in the University of Zagreb, where she eventually became a full professor in 2008. She actively participates in teaching in-clinic, pre-clinic and continuing education. She is also the head of post-graduate and PhD courses. She obtained her masteral degree in 1998 and PhD in 2000, and she passed the specialist exam in endodontics and restorative dentistry in 2004.

Dr. Miletić is the author and co-author of four coursebooks and many other scientific reviews, educational and specialised articles, which are also cited in numerous international journals and coursebooks. She particularly specialises in the field of endodontics, where she has actively worked on various scientific projects from 1996 until today.

Dr. Miletić has been participating in several national and international congresses and has conducted several lectures. She is an active member of the Croatian Chamber of Dental Medicine, Croatian Endodontic Society, Croatian Medical Association, European Endodontic Society, ORCA and IADR. She is the president of the Croatian Society for Minimum Intervention Dentistry.