

Immediate Restoration of Class II Cavity by Layering Technique with the Use of Flowable Composite

Case Study

Introduction

Aesthetic fillings made by using composite layering technique enable operators to respond to aesthetic requirements, as well as their quick action in socially demanding situations. Any additional innovative material in terms of shortening the time of treatment without compromising the quality is certainly a benefit and the aim of every operator and patient.

This case study shows exactly this simplicity and possibility of quick layering, thanks to a flowable material consistency and its final physical properties, which are achieved after polymerisation.

Composite layering techniques are based on the modelling of laboratory ceramic materials, layer by layer. They enable highly aesthetic teeth restoration. Such techniques allow dentists to work directly in the mouth and provide a general aesthetic overview of the facial structure. They also offer patients a possible solution in one visit, and they provide a solution for aesthetically urgent needs in connection with injuries to the frontal, posterior and intercanine areas with a more affordable result.

Nowadays, it is expected of a modern composite material to be easy to use and to have physical properties that include periodontal physiological loading, uniform abrasion coefficient and stable function over a longer period of time.

Case Study

A 44-year-old female patient visited our dental practice for consultation on her problem and solving her overall oral health state in the most optimal way with respect to her financial means.

The teeth were clinically examined and recorded (OPG image – Figure 1).

The image showed problems requiring systemic planning and restoration. In consultation with the patient, we decided to replace the old and worn out amalgam and composite fillings. In the course of the first visit, a revision of tooth 27 was made, with composite replacement of the previous filling (GC G-aenial posterior composite was used) and a plan to shorten it on a later occasion, from the point of view of prosthetic indication.

The next step (which will be shown here) was replacement of the old amalgam filling with a new generation composite – GC Europe G-aenial Universal Flow.

The tooth concerned is the upper second left molar (Figure 2). After applying a local anaesthetic and initial removal of the old amalgam filling, chemical testing in connection with possible remaining secondary carious dentin tissue was carried out by application of a caries marker. After rinsing, the marked carious tissue was removed, after which, enamel rims of the prepared cavity were slanted and polished (Figure 2a).



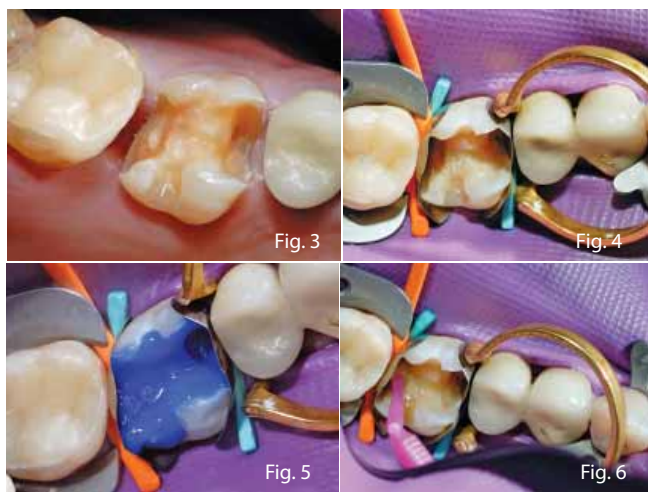
Fig. 1



Fig. 2



Fig. 2a



When the tooth was fully cleaned and ready for restoration, a rubber dam with corresponding clamps was placed. Enamel and dentin surfaces were conditioned using orthophosphoric acid gel (37%) for 15 seconds (Figure 5). The cavity was afterwards washed and dried completely. One component – self-etching, light-curing adhesive GC G-aenial Bond was used thereafter (Figure 6). After light-curing of the adhesive, composite GC G-aenial Universal Flow was applied along the approximal walls by means of an instrument for shaping matrix contours during polymerisation (Figures 7 & 8).



The shade AE (Adult Enamel) was used in order to obtain natural transparency and translucency of the approximal surfaces. The shade was determined by means of a Vita Easyshade colour determination device (it is also possible to use the Vita Classical shade guide). In this case, A3 shade was chosen in agreement with the patient, given the ultimate goal to whiten all the teeth.



GC G-aenial Universal Flow is available in a wide range of standard shades (A1, A2, A3, A3.5, A4, B1, B2, B3, C3, BW, CV), as well as outside (AE and JE) and inside (AO2 and AO3) shades (Figure 14). Thanks to the low refractive index of the filler (ultra-fine strontium glass, particle size approximately 200nm), the filling was clearly visible on the x-ray and very translucent and transparent. A high share of fillers (69%) treated with silane provided excellent physical properties, which can be compared with the properties of classic putty composites (bending strength, high modulus of elasticity, increased fracture resistance and wear resistance). After polymerisation of the approximal surfaces, layering of the central cavity was performed (A3, BW, AE) (Figures 9 & 10).

After layering was completed, matrices were removed and the process of contouring (Figure 11) and polishing of the restoration (Figure 12) was started. Contouring was performed by means of Soflex discs, and precise final finishing was carried out by means of Shofu discs and Comet diamond burs for contouring of occlusal surfaces. After anatomic shaping, cusps were occlusally adapted and checked in terms of function, and polishing was performed with rubber points





Fig. 12

and diamond polishing pastes in three steps. The final result shown in Figure 13 was completely satisfactory for the patient. The figure shows a filling characterised by high gloss in relation to the filling made a few days earlier, which was polished the same way. This can be explained by the fact that ultra-fine strontium glass was used as the filler, so that even unpolished surfaces receive and retain gloss over time (I noticed this two-and-a-half years of using this material). G-aenial Universal Flow has a very low shrinkage stress, which helps preserve the tooth structure at the cavity edges and undoubtedly reduces nano-leakages and fracture of the filling.



Fig. 13



Fig. 14



Fig. 15

Working in this way, it can often be observed that the remaining enamel and adjacent teeth are considerably dehydrated, which is reflected in a slightly stained whitish tooth colour and questions the correctness of the used colour. It is often necessary to wait several hours or arrange another visit to check the colour and perform final polishing, after complete rehydration of teeth (approximately nine or more hours). In this case, after rehydration, it was found that the filling was fully integrated with the surroundings (Figure 15).

Conclusion

This clinical case shows that, from the launching of flowable composites until today, the concept and indications for their usage greatly expanded. Nowadays, a new generation flowable composite (GC G-aenial Universal Flow) can be applied for all indications (Class I, II, III, IV and V), and it achieves physical results comparable or better than conventional composites, especially in connection with high bending strength and wear resistance.

The presented technique allows operators to solve aesthetic problems of patients quickly and immediately, with predictable positive outcome that satisfies both the patient and the operator. This composite material allows numerous adjustments without loss of time, expensive materials or loss of patients' trust. In this time of economic recession, it is a good way to offer aesthetic solutions at an affordable price for patients. **DA**

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About the author



Dr. med. dent. Blaženko Crnojević obtained his dental medicine degree in Zagreb in 1983. Dr. Crnojević has been employed in public health institutions in Croatia and Slovenia. He has been self-employed since 1994 when he put up his own practice. He is a member of numerous international organisations in the fields of dental medicine and medicine. He is one of the key opinion leaders for six international companies and an official assistant for international companies GC, Implant Direct and BTI. He has participated in numerous national and international conferences as an active lecturer, as well as in the development of materials and methods in medicine and dentistry. He has also been a lecturer in the field of nutrition for the last two years.