

User case study bulk composite Fill-Up! by COLTENE

DR. MED. DENT. CHRISTOPH HÜSKENS, FREIDORF/SWITZERLAND
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In this case, a young patient was provided with a direct posterior tooth restoration using the dual-curing, medium-viscous bulk composite Fill-Up! (with antibacterial zinc oxide additive) and an approx. 2 mm covering layer of the established hybrid composite SYNERGY D6 (by COLTENE).

Introduction

Composite restorations in the posterior tooth region have for decades proven to be a suitable alternative to metallic fillings such as amalgam, which many patients refuse these days. During this time the material group of composites

has been continuously improved. The new generations of bonding agents, less polymerisation shrinkage and greater abrasion resistance, together with modern layer techniques, have today become the standard in dental practice.

Nonetheless, composite restorations in the posterior region still remain quite time-consuming. To meet the needs of many dental practitioners for simplification, particularly with regard to the time-consuming layer technique in the less aesthetics-oriented posterior region, the dental industry has for some time now started developing a variety of bulk fill composites. To date

there have been two groups, the bulk fill composites with low viscosity and the bulk fill materials with high viscosity. Fill-Up!, which is presented here, can be classified as a new third group of bulk fill materials with medium viscosity with good abrasion stability.

The expression "bulk fill" actually implies "filling in a single step". This means quick and simple application and finishing, less polymerisation stress and good durability at lower technique sensitivity with the known bonding agents, as well as adequate bonding to enamel and dentine. The maximum curing depth of 4-5 mm remains a limiting factor with



Fig. 1: Initial situation: secondary caries underneath old composite filling on the first mandibular molar

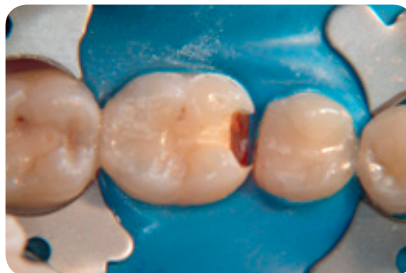


Fig. 2: Removal of old filling under dental dam



Fig. 3: Cavity with applied matrix



Fig. 4: Determination of cavity depth using a scaled periodontal probe



Fig. 5: Conditioning of cavity with phosphoric acid (Etchant Gel S, COLTENE)



Fig. 6: Application of bond on enamel and dentine (ParaBond, COLTENE)

many bulk fill materials, both for low and high viscosity composites.

However, the Fill-Up! material used here is a dual-curing bulk composite. This allows the application of layer thicknesses of more than 5 mm in a single step, without any impairment in curing of the entire increment.

This is of an advantage in the case of approximal surfaces in the posterior region, for example, if deep root caries is also present in a Class II. Reliable chemical curing is assured after 3 minutes (including processing time), it is not essential to measure whether a layer thickness of between 4-5 mm can be attained. By using additional short light-curing, the polymerisation process of the upper layers can be accelerated and the filling processed directly. Slight post-darkening is generally observed with chemically curing materials. With the Fill-Up! Universal material used here, the final shade is achieved after 24 h and is comparable to the shade VITA™ A2/A3.

Only few patients demand highly aesthetic restorations in the poorly visible posterior region, so the disadvantage of different shaded fillings can be ignored after the first molar in both the maxilla and the mandible. For example, this includes patients presenting in the dental practice for the replacement of old amalgam fillings or also patients who want shorter treatment sessions. This also applies to the treatment of children, which will not be addressed in this case study.

Using the dual-curing Fill-Up! bulk composite it is possible to facilitate Class I and Class II fillings quickly and easily. The material used demonstrates excellent flow behaviour here, which is extremely helpful, especially for deep Class II fillings.

An approx. 2 mm thick covering layer of hybrid composite, here SYNERGY D6, is not essential, but was chosen in this case for occlusal design purposes and improved aesthetics as well as approximal contact point design. This also reinforces

the mechanical stability of the entire filling.

Highly viscous bulk fill materials with a limited range of shades can be used for modelling, but the poorer adaptation behaviour at this viscosity can lead to the known problems of primary marginal gaps or air bubbles. Therefore, this material group is not the optimal solution per se.

When performing a cover layer filling, it is possible to fill the cavity in two steps when using the Fill-Up! material applied here. This also represents clear savings in time compared with the usual 4-5 increments for conventional methacrylate-based hybrid composites and the corresponding longer and additive exposure times. The S.P.E.C 3 polymerisation lamp by COLTENE used here, takes 5 seconds at a performance setting of 1600 mW/cm². Add to this the manufacturer's reference that the recommended exposure time should not be exceeded to keep the shrinking stress



Fig. 7: Application of Fill-Up! (COLTENE)

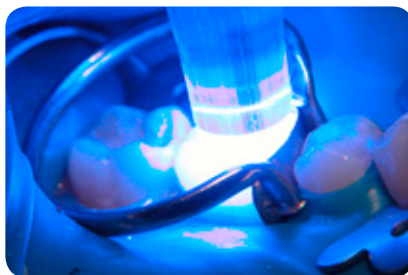


Fig. 8: Light polymerisation of Fill-Up! with S.P.E.C 3 lamp (COLTENE) for 5 s



Fig. 9: Cavity filled with Fill-Up!, whereby approx. 2 mm of room were left occlusally for a covering layer of SYNERGY D6 (COLTENE).



Fig. 10: Final outcome, filling after 4 weeks



Fig. 11: Final outcome, fillings mandibular premolar, opposite molar after 4 weeks

as low as possible. In addition, it is also recommended to adhere to the curing time of 2 minutes in case of very deep cavities (over 4-5 mm) to avoid adhesion of the material to the matrix.

Using Fill-Up! for Class II cavities

The new Fill-Up! bulk composite lends itself for use on the young patient with approximal secondary caries on tooth 36 mesial (Figure 1). The cavity is prepared after drying with the dental dam (Elasti-Dam, COLTENE). Applying the known rules for the acid etching technique, Fill-Up! was quasi underfilled to approx. 2 mm below the preparation margin before applying the covering layer of SYNERGY D6. Finishing and polishing was performed with DIATECH products by COLTENE.

Conclusions

Every time we want to use a good flowing composite for larger cavities in our practice, without having to accept the known disadvantages of shrinking stress, then the Fill-Up! bulk composite is an excellent complement to our present range of composite materials (for example, SYNERGY Flow or SYNERGY D6). The dual-curing principle is a major advantage compared with the existing thin-flowing bulk composites presently available on the market, for example, Filtek Bulk Fill

by 3M ESPE. The conventional maximum layer thickness of 4-5 mm can certainly be exceeded without drawbacks in daily routine. A good restoration can also be ensured if the the increment lies in the so-called "light shadow" of the polymerisation lamp. The material properties described here can also prove useful when filling a root-treated tooth and result in quicker restoration of the tooth.

With the Fill-Up! bulk composite by COLTENE, one can be assured that the dual-curing material is completely cured in every part of the filling after 3 minutes (including processing time).

The offered product is convenient and simple to handle (i.e. due to the different diameters of the mixing tip attachments). In addition, the filling with bulk and hybrid composite represents a clear advantage in terms of time saved when compared with conventional filling methods consisting of several small increments. And finally, the application of a covering layer of SYNERGY D6 results in good aesthetics as well as contact point design.

CONTACT

Dr. med. dent Christoph G. Hüsken
Herrenwiese 3
CH-9306 Freidorf TG/Switzerland
www.hueskens.ch

