

# PARTICULARITIES OF TREATMENT WITH BULK FILL FLOW COMPOSITES

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**Keywords:** composite material, bulk fill flow, stress  
**Abstract:** Composite materials are used in the everyday practice in dentistry. The work technique that uses composites has been developed to counteract the high contraction inlet. The development of composites with increased elasticity has triggered changes in the work technique. When using the bulk-fill flow composite a thick layer of material can be placed on the floor of class I&II cavities with the intention to reduce the internal structural stress of the tooth and of the filling material.

## INTRODUCTION

The composite materials are the most common materials used in direct restoration. They have become the material of choice for fillings even for the lateral region of the dental arches.(1) Under these conditions the limits of the materials have become obvious. The problem with the solid composites is the formation of gaps at the insertion of material and the polymerization shrinkage.(2,3)

The polymerization shrinkage will induce stress to the tooth walls, especially there where these are thin such as the cuspal region of the cavities of class II-a.(4,5)

The effects of the polymerization shrinkage occur immediately or later. Among the immediate reactions we can enumerate the postoperative sensitivity and the pulp inflammatory reactions, among the late reactions we can enumerate the marginal microinfiltration, secondary caries, cuspal fracture, necrosis.(6)

Several approaches have been applied over the years in order to diminish the polymerization shrinkage of the composite resins, such as the raise of the inorganic fillings and the modification of the organic matrix, the removal of triethylene glycol dimethacrylate (TEGDMA) from the composition of the monomers, the appearance of the silorane-based composites.(7,8,9) A new solution to the same old problem of the polymerization shrinkage represents the bulk-fill flow composite materials.(10,11,12)

## PURPOSE

The aim of this article is to present the work technique with the bulk fill flow composites and the advantages of such material.

## MATERIALS AND METHODS

The working method applied for bulk-flow materials are:

- The steps for the preparation of the decay process are classical: defining the marginal contour, reducing the thin walls, preparing a convenience form, removing the altered dentine.(13)
- As we have to deal with direct restorations, the application of a rubber dam is recommended. The neighboring teeth are isolated too, when the contact point between two teeth must be re-created.

- Uses etch&rinse or self-etch adhesive systems.
- Up to a 4mm thick layer of bulk-fill flow material can be applied in the cavity followed by a solid composite layer of min 2mm.(14,15)

The used materials are:

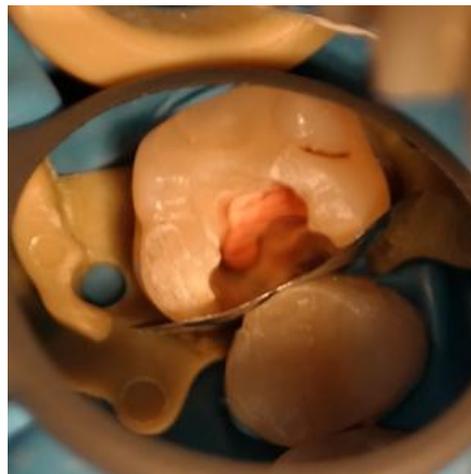
- the adhesive system,
- the bulk-fill flow composite,
- a compactable composite.

## CLINICAL CASE

The tooth 1.6 had a root canal treatment performed prior to the restoration treatment (figure no. 1). A preformed matrix was used to define the proximal wall. Glass-ionomer cement was applied on the pulp chamber floor to make the identification of the root canals openings easier in case that a future endodontic retreatment becomes necessary (figure no. 2).

The next step was the application of the adhesive system. In the vertical and the horizontal cavity a bulk-fill flow composite material was applied (figure no. 3). The last applied layer was the compactable composite material (figures no. 4,5).

**Figure no. 1. Tooth 16 prepared for filling. Gutapercha is visible on pulp chamber floor and root canal entrance. Cuspal reduction can be seen at the level of mezo-vestibular cusp**



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**Figure no. 2. Glass ionomer cement applied on the pulp chamber floor**



**Figure no. 3. Bulk-fill flow composite applied in the vertical cavity in the gingival floor area**



**Figure no. 4. Insertion of the compactable composite in the cavity**



**Figure no. 5. Tooth 16 before finishing. One can observe the restoration with cuspal coverage in the vestibular wall area**



By means of these bulk-fill flow composites I provided a fast, aesthetic restoration, with an increased elastic infrastructure and resistance to occlusal stress.

### DISCUSSIONS

The use of bulk-fill flow material has been discussed in the specialist literature of the past years with regard to the depth of polymerization, material hardness and physical properties.(10,11,12) From the clinician's point of view the work flow and the way in which the dental tissues are prepared for this new material are very important in order to obtain durable results.

For composite materials dental fillings, a serious problem is the frequent replacement of the fillings.(16) By selecting a suitable work technique and choosing modern materials such as the ones of the type bulk-fill flow, the frequent replacing of the fillings can be reduced. Their use can also lead to a reduction of the frequent dental fractures caused by the incorrect modelling of the remaining dental tissues during cavity preparation.

Currently, in the specialist literature you will find discussions on layering of composite materials in the lateral area of the dental arch, on the use of the oblique or horizontal layering technique with reduced thickness of 2 mm according to the width and the depth of the cavity.(17,18,19,20) The layering is time consuming and may include air gaps with high risk of fracture.(21) These materials transmit the stress to the dental walls.(22)

The bulk-fill flow materials are known to have an increased elasticity and offer the possibility to be applied in layers with a greater thickness than the compactable composites.(23) They can be applied with a thickness higher than 4 mm, thus leaving only a small part of depth of the cavity filled with compactable composite material.(2,17,23,24,25,26) The increased elasticity of bulk fill flow type composites may reduce the tensions at the cuspal level.

The final layer of solid composite material is applied over this material with increased elasticity. The cuspal reduction and the restoration with composite materials increase the life of the tooth rather than the technique which does not use cuspal protection.(27)

### CONCLUSIONS

The use of composite materials of the bulk-fill flow is a very much up to date theme in the specialist literature of dental medicine. A deeper understanding of the work technique is required for this type of materials which is not standardized at present. These materials introduce a new concept, that of elastic composite materials, but they require a final layer of a compactable composite material.

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