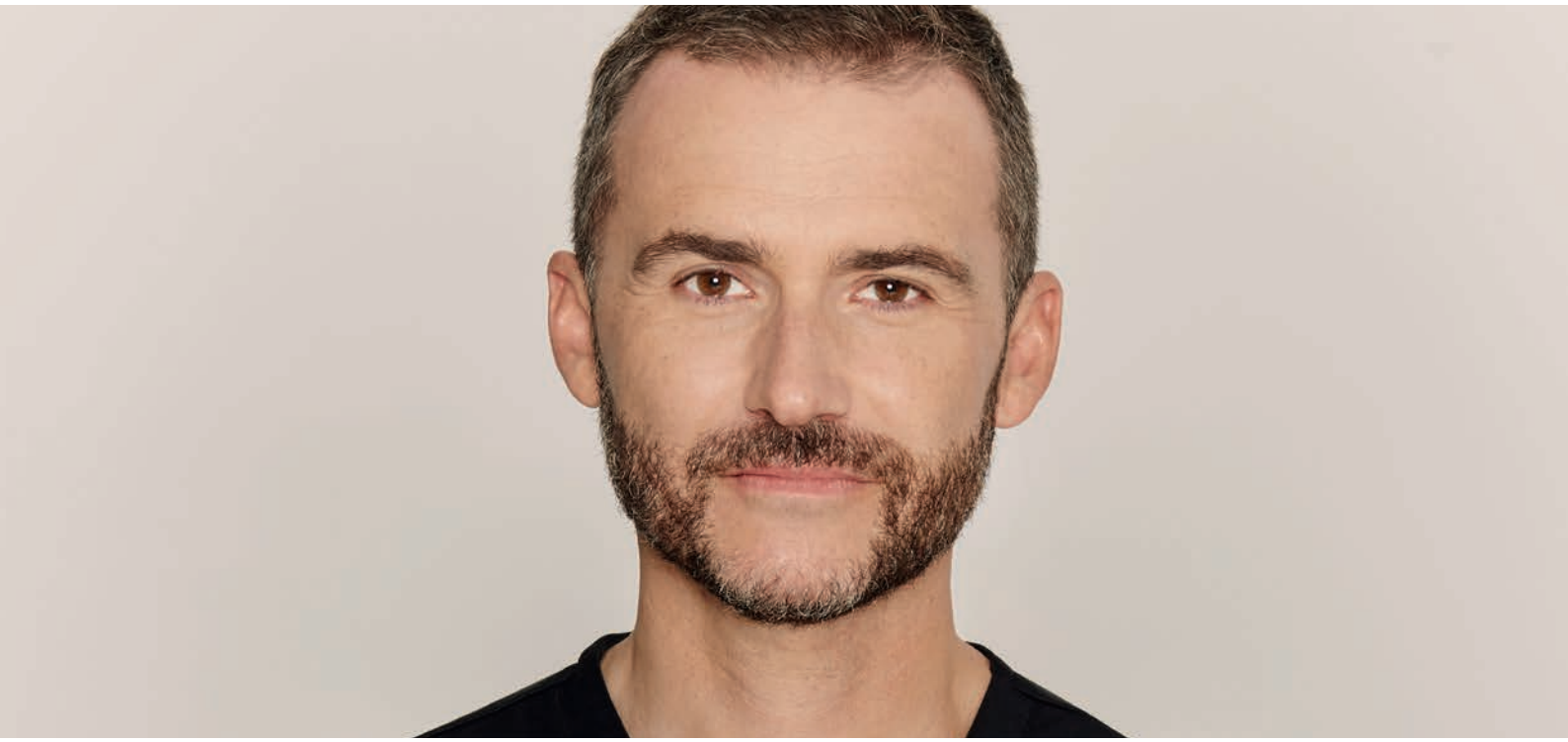

Bio-Bulk fill treatment of deep caries

Michal Ganowicz DDS PhD

I am a specialist in conservative dentistry and endodontics with 20 years of experience working in Warsaw, Poland. My daily practice involves treating complex issues such as occlusion and temporomandibular joint disorders.
I am particularly passionate about using composite materials and employing biological treatment methods. I fully endorse the power of adhesion and the regenerative abilities of the pulp.

During my lectures and workshops, I advocate for simplified dental treatment procedures as I firmly believe they are the optimal choice for both dentists and patients alike.

For how long have you been using Biodentine™?

I have been using Biodentine™ for 5 years.

Why do you use the Bio-Bulk Fill procedure with Biodentine™? What are the main advantages for you?

The most important thing is the positive effect of Biodentine™ on pulp healing. For me, it is a tool to prevent root canal treatment.

When do you use the Bio-Bulk Fill procedure?

I use the Bio-Bulk Fill procedure with Biodentine™ most often for direct and indirect pulp capping. Occasionally I also use it to treat cementum caries and to seal perforations in root canals.

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Summary

Introduction
A vital pulp produces dentine, nourishes the hard tissues, conducts stimuli and participates in the immune response. A tooth with a vital pulp is always better than a non-vital one. Therefore, practising dentists should spare the hard tissues of the tooth and the pulp at all costs and use materials and methods that minimise the need for intervention.

Methods
In a tooth treated with zinc oxide with eugenol for deep caries, a Bio-Bulk Fill filling was placed using Biodentine™ as a dentine substitute and composite. The final filling, which was carried out in two stages, fulfilled its purpose as a method of preventing pulp necrosis while also acting as a permanent filling.

Discussion
The methods of choice should be those that can postpone the need for root canal treatment and preserve tooth structure and pulp vitality. Indirect pulp capping with Biodentine™ fulfils these criteria, as Biodentine™ has a positive effect on the condition of the pulp, promotes remineralisation and dentine restoration, and acts as a restorative material. Biodentine™, covered with a 1.5-2 mm layer of composite, eliminates the problem of abrasion and the aesthetics of the filling, while retaining the positive properties of the bioactive cement. The best option is to treat the tooth in two stages: at the first visit, fill the entire cavity with Biodentine™; at the second visit, after two weeks, cover the Biodentine™ with composite.

Conclusion
The Bio-Bulk Fill method with Biodentine™ works well in the treatment of deep caries. Biodentine™ as a dentine substitute, combined with an outer layer of universal composite, works perfectly as an aesthetic permanent filling.

Introduction

The current method of choice for treating tooth decay is to prepare the cavity and fill it with composite material. Properly performed, composite fillings effectively restore tooth function, and their effectiveness has been proven in millions of cases. However, this treatment is essentially prosthetic. Every filling, even the smallest, is a prosthetic. At the same time, we know that healthy enamel, dentine and pulp are precious. A vital pulp produces dentine, nourishes the hard tissues, conducts stimuli and participates in the immune response. A tooth with a vital pulp is always better than a non-vital one. Therefore, practising dentists should spare the hard tissues of the tooth and the pulp at all costs and use materials and methods that minimise the need for intervention.

Case report

Clinical signs and symptoms

The patient presented with hypersensitivity of tooth 16. The tooth had been treated two months previously for a deep MOD cavity with a zinc oxide-eugenol paste. Due to the poor mechanical properties of such a temporary filling, parts of the dentine were exposed, hence the hypersensitivity symptoms. Tap test was negative. The response to cold stimuli was normal.

Diagnosis

Deep caries, uncomplicated.

Procedure and treatement

After anaesthesia and application of a rubber dam, the cavity was prepared. The dentine was left demineralised on pulp chamber walls of the cavity. A minimum of 2 mm of hard tooth tissue was left fully prepared and hard around the cavity margin to ensure tightness of the future restoration. The proximal walls were restored with A3 universal composite after etching and using a universal bonding system at the cavity margin. The rest of the cavity was filled with Biodentine™ up to the occlusal surface. After 12 minutes of initial setting of the Biodentine™, the rubber dam was removed and the patient was sent home. The next appointment was scheduled for two weeks.

Between visits, the patient had no toothache and the sensitivity diminished. The sensitivity to cold was still normal. Therefore, a rubber dam was placed and 1.5 mm of the outer layer of Biodentine™ was removed. In this case, it was not necessary to anaesthetise the tooth. After selective enamel etching with a universal bonding system, the cavity was filled with one layer of A3 universal composite, prepared and polished.

Follow up

One year after the last visit, the patient has no sensitivity and the tooth responds correctly to stimuli.

Fig. 01 - Tooth 16 with MOD cavity and deep caries. Two months after treatment with zinc oxide with eugenol.

Fig. 02 - Tooth after preparation.

Fig. 03 - Restoration of the proximal walls with composite material.

Fig. 04 - Filling of the rest of the cavity with Biodentine™.

Fig. 05 - Temporary long-term restoration with Biodentine™.

Fig. 06 - Tooth after two weeks. A rubber dam was fitted.

Fig. 07 - Tooth after removal of 1.5 mm Biodentine™.

Fig. 08 - Selective enamel etching.

Fig. 09 - Tooth after application of the universal bonding system.

Fig. 10 - Tooth after application of a single layer of A3B universal composite.

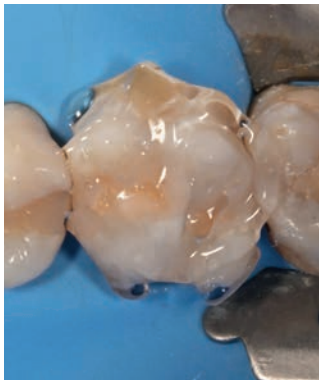

Fig. 11 - Glycerine-mediated polymerisation of a composite.

Fig. 12 - Filling after initial preparation and polishing.

Fig. 13 - Bio-Bulk Fill.

Discussion

Untreated caries eventually leads to destruction of the hard tissues of the tooth, inflammation and even pulp necrosis. Therefore, the methods of choice should be those that can postpone the need for root canal treatment and preserve tooth structure and pulp vitality. Indirect pulp capping with Biodentine™ fulfils these criteria, as Biodentine™ has a positive effect on the condition of the pulp, promotes remineralisation and dentine restoration, and acts as a restorative material. In addition, according to the author's clinical experience and the observations of other authors, Biodentine™ works well in direct pulp capping in cases of irreversible pulpitis.

After filling the entire cavity with Biodentine™ and waiting 12 minutes, we can send the patient home. Unfortunately, Biodentine™ is not suitable as a permanent filling due to its abrasiveness and colour. According to the manufacturer's recommendations, it can be used as a long-term temporary filling for up to six months. However, if we use the Bio-Bulk Fill method and cover Biodentine™ with a 1.5-2 mm layer of composite, we eliminate the problem of abrasion and the aesthetics of the filling, while retaining the positive properties of the bioactive cement. In this case, the Biodentine™ acts as a dentine substitute and the composite as an enamel substitute. Together they can function as a permanent restoration for many years.

In theory, we can cover Biodentine™ with composite 12 minutes after application. However, it is better to wait at least two weeks for the material to fully cure if possible. After this time, it will have a micro-hardness like natural dentine. After this time, a stronger bond between the bonding system and its surface is also achieved. Another consideration is the ability to control the vitality of the pulp over time. This will be particularly important in the case of direct pulp capping in a state of irreversible pulpitis.

Conclusion

The Bio-Bulk Fill method with Biodentine™ works well in the treatment of deep caries. The application of bioactive cement to demineralised dentine preserves as much hard tissue as possible and significantly reduces the risk of pulp necrosis. Biodentine™ as a dentine substitute, combined with an outer layer of universal composite, works perfectly as an aesthetic permanent filling.

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