

# BisiCAL

## The calcium plaster for the pulp

The following is a report on a clinical trial of a vitality-preserving treatment option using the product BisiCAL, a bioactive, light-curing, resin-modified calcium silicate for pulp capping with MTA fillers.

**Text** dentist Romy Dech

**Picture** dentist Romy Dech, bisico GmbH & Co. KG

### Initial situation

A 39-year-old female patient presented at our practice for conservative treatment, with some insufficient fillings due to secondary caries. The X-ray shows the fillings as being close to the nerve. In this respect the treatment plan included indirect or direct pulp capping. In this case, the new pulp capping material BisiCAL from the company bisico GmbH was able to be used.

### Treatment

We removed the insufficient filling as well as the caries on tooth 15. After the removal of the caries profunda and preparation of the cavity with relative drainage, the cavity was dried with air and Bisi CAL was used for indirect pulp capping.

The material is very easy to apply thanks to it being a single-component material. Mixing is no longer necessary. The dentist therefore saves time in the treatment process. In addition, consistency is always ensured which means that precise work is guaranteed within the framework of quality assurance.

The syringe attachment makes applying the material light and practicable. However, the opening is still a little too big for my liking. This could be smaller to allow for even more precise work. In contrast to traditional materials, BisiCAL can be modelled well and provides good stability. The material could also be modelled well with the caries probe, without sticking to the instrument.

After the BisiCAL layer had been positioned and checked, it was then light-cured with the polymerisation lamp for 40 sec. In my opinion, this light curing is one of the major benefits of indirect or direct pulp capping with the BisiCAL. It prevents the applied material from slipping and enables further direct work to be carried out.

After light curing, the cavity was etched with phosphoric acid according to the treatment protocol. This was followed by further pretreatment of the cavity with the bonding agent E-Bond LC and subsequent 20 sec. light polymerisation with the Bluephase PowerCure (Ivoclar Vivadent). We then applied the filling material Kalore A1 in individual layers and carried out the appropriate intermediate curing via light polymerisation. The filling was then finished with diamond and carbide burs, a Sof-Lex™ disc and polished with a plastic polisher.



1  
*Situation before*



2a  
*Cavity drilling*



2b  
*Cavity drilling*



3a  
*application of BisiCal*



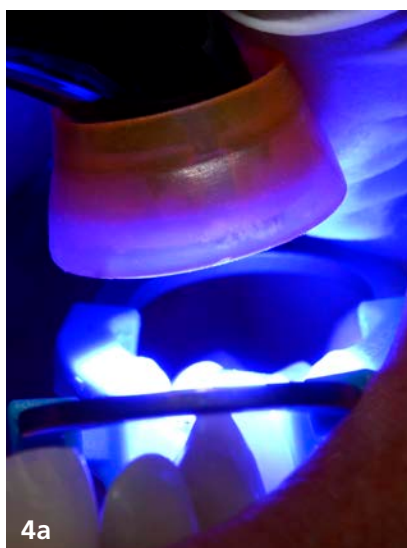
3b  
*application of BisiCal*



3c  
*application of BisiCal*



3d  
*application of BisiCal*



4a  
*Curing of the material*



4b  
*Curing of the material*

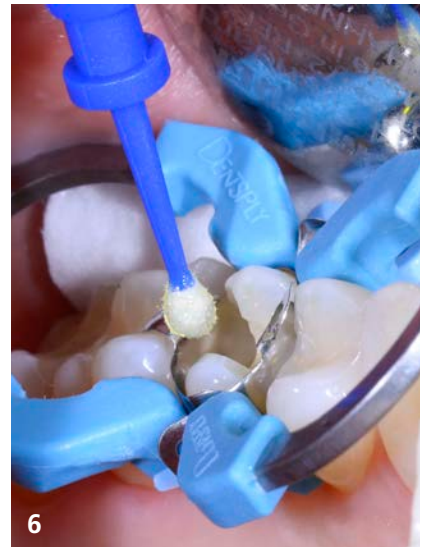




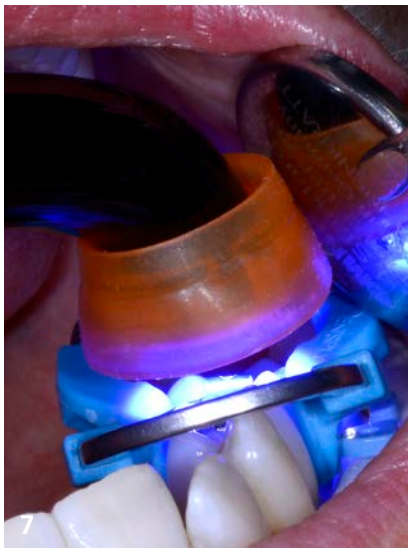
*Curing of the material*



*Etching of the cavity*



*Bonding the cavity*



*Light curing of the bonding*



*Plastic layering*



*Final situation*

## Conclusion

BisiCAL can be easily integrated into the workflow of conservative treatment and makes the work involved in indirect and direct pulp capping much easier due to its good handling, application and light curing properties. My team and I were impressed with the product during the test and we will integrate it into our daily practice.

## Romy Dech

dentist

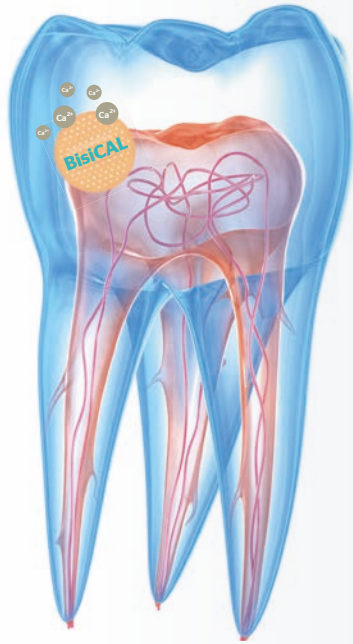
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**Text** Dr. Benjamin Kette

**Picture** Dr. Benjamin Kette, bisico GmbH & Co. KG

## Initial situation

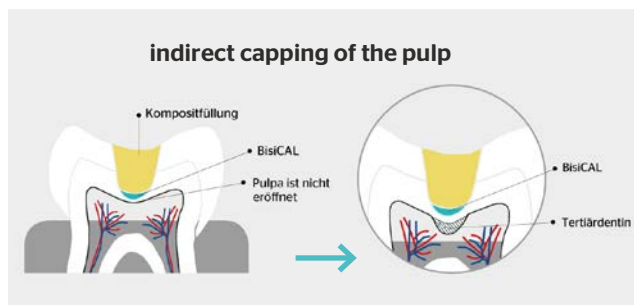
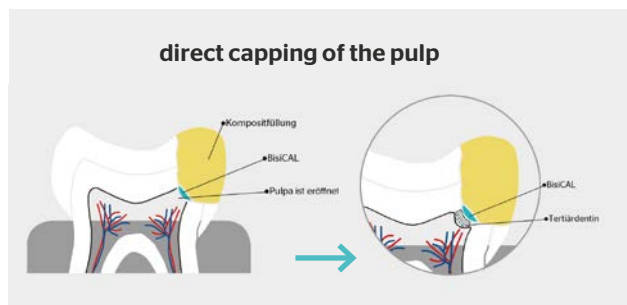
The following patient presented as a new patient with no previous complaints. The initial situation (Fig. 1) shows the old fillings with shiny greyish secondary caries spots on teeth 24 to 26. The teeth were all vital, insensitive to percussion and palpation, free of poor probing depths and also did not show any apical inflammation.

## Treatment

After removal of the old fillings (Fig. 2), the secondary caries appeared over a large area. With careful removal of the caries, the pulp horn of tooth 26 was opened. After disinfection and haemostasis using 2% sodium hypochlorite rinse (Fig. 3), the teeth were prepared for filling with a Tofflemire matrix band under relative drainage (Fig. 4). By stopping spontaneous bleeding within three minutes, we

were able to carry out direct pulp capping using light-curing BisiCAL. Otherwise, classic root canal treatment would have been necessary or a pulpotomy, which has recently started to be applied again thanks to MTA and Biodentine.

After checking the drainage, we applied BisiCAL directly to a small area of the opened pulp with a small ball plugger (Fig. 5). Selective enamel etching using 37% phosphoric acid was carried out for 30 seconds following exposure of the cavity walls, so as not to endanger the dentin area close to the pulp during spraying. The dentin was rewetted for one minute using 2% Chlorhexamed rinse. The teeth were adhesively conditioned using E-Bond LC. BisiCAL is so positionally stable that it is not sprayed off after light curing. As things progressed, the two composite restorations on teeth 24 and 26 were layered in a multi-layer technique. First, the missing proximal walls were restored and then the cusps were built up with proximal finishing (Fig. 6). Distally on tooth 25, we also used BisiCAL as an indirect cap - but in reverse order







Initial situation of old composite fillings with secondary caries on teeth 24-26



Removal of the old restorations and visualisation of the caries



Complete caries excavation with opened pulp horns. Tooth 26 was haemostatic and disinfected with 2% sodium hypochlorite.



Preparation for filling placement on teeth 24 and 26 after relative draining.



Direct capping with BisICAL MTA on tooth 26 and application of E-Bond-LC



Fillings placed in the approximal space on teeth 24 and 26, indirect capping on tooth 25



Final X-ray image of the fillings placed on teeth 24 to 26



Finished and polished composite restorations on teeth 24 to 26

of treatment. First selective etching was carried out, then. The final X-ray (Fig. 7) was used to recheck the marginal seal of the restorations, possible filling overhangs and the proximity of the restoration to the nerve. Figure 8 shows the finished and polished restorations on teeth 24 to 26. Since the treatment, the patient has been pain-free and is very satisfied with his new fillings.

## Discussion

Applying BisiCAL pulp capping material with MTA fillers directly from the syringe saves a lot of time. Light curing in particular has its benefits compared to chemical curing of other well-known products for maintaining the vitality of the teeth, such as Kerr Life, Dycal or MTA. BisiCAL is best applied using a small ball plugger. If the application needle were a little narrower or the consistency of the material a little more viscous, it would be possible to work directly with the application syringe.

The consistent quality of the material, without any mixing errors on the part of the dentist or the assistant, ensures optimum treatment results. Setting by light curing is perfect, as it cannot be sprayed off even after the teeth have been conditioned with phosphoric acid.

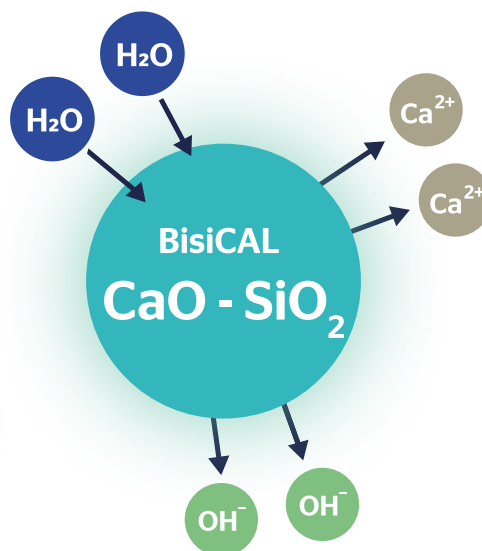
The treatment sequence described avoids over-etching in the area close to the pulp and reduces postoperative discomfort. BisiCAL simplifies and speeds up the entire workflow in dealing with deep filling placement and in striving to preserve vitality in routine daily practice, and ensures a good treatment outcome. However, the correct diagnosis for treating a caries or caries profunda remains essential.



**Dr. Benjamin Kette M.Sc.**

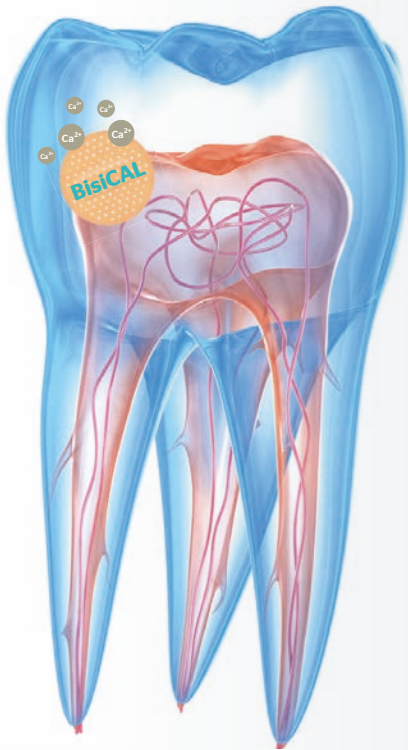
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## product information



BisiCAL is a bioactive light-cure resin reinforced pulp capping material with MTA-fillers. The release of calcium-ions supports the formation of tertiary dentine. The result is a safe pulp protection. The high alkaline pH level has bactericidal effects and thus supports healing and protects against hypersensitivity. BisiCAL is moisture tolerant, insoluble and shows a high radiopacity. Thanks to its thixotropic behavior and with the supplied needletip BisiCAL can be applied very precisely, even in deep cavity preparations.

Light cure of BisiCAL ensures controlled setting. After 40 seconds of light curing the next clinical step is possible. BisCAL is a one-component material, mixing times and errors are avoided. The light curing process ensures a fast and controlled fixation of the material. The high pH value creates an environment that is hostile to bacteria. Thanks to bioactive fillers, tertiary dentin (hydroxyapatite ( $\text{Ca}_5(\text{PO}_4)_3(\text{OH})$ ) is formed by releasing  $\text{Ca}^{2+}$  and  $\text{OH}^-$  ions. The pulp is protected and supported in healing.



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**Text** dentists Dipl.-Stom. Ursula and Andreas Bäßler

**Picture** dentists Dipl.-Stom. Ursula and Andreas Bäßler, bisico GmbH & Co. KG

### Initial situation Case1 - Direct Capping of 14

A 77-year-old patient presented to our practice on 19/5/2021 with pulpitic complaints relating to tooth 14. During the assessment, the vitality (cold stimulus) was tested for positivity before we anaesthetised the patient for treatment.

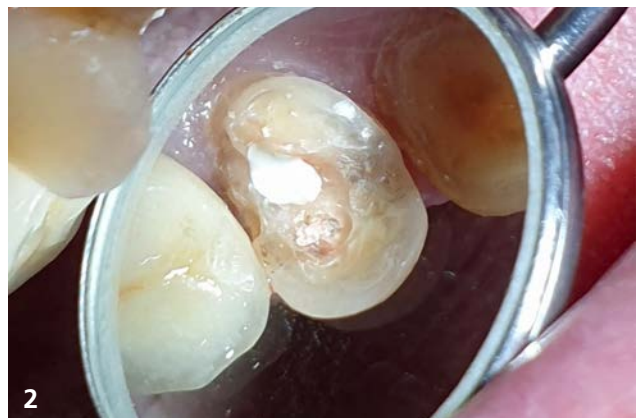
The X-ray showed a caries profunda close to the dental nerve, which is why we decided to perform a direct capping with the BisiCAL pulp capping material from bisico GmbH.

### Treatment Case 1

Due to the excavation of the caries profunda, under local anaesthetic delivered to the terminal branches of the nerve, the pulp cavity was opened with simultaneous haemostasis. Cavity disinfection was performed with sterile cotton pellets and 3% sodium hypochlorite solution. After relative draining, we performed direct capping of the pulp with BisiCAL. This was followed by the conditioning of the cavity with E-Bond LC from bisico. Finally, a multi-surface composite filling was placed (Fig. Case 1, Figs. 1 to 4).



situation after excavation.



Step-by-step introduction of BisiCAL

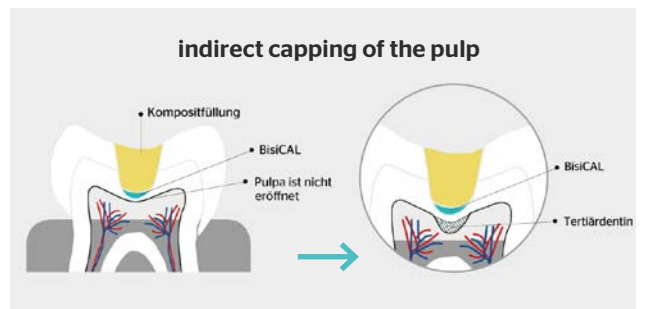
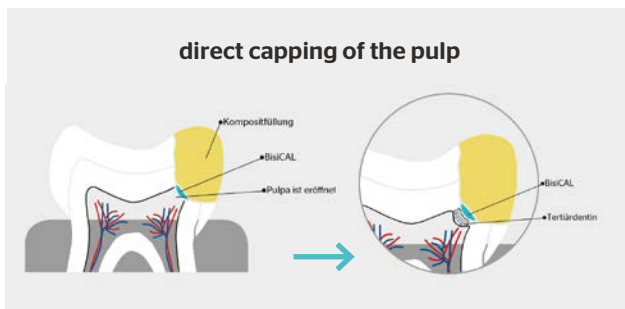




complete direct capping



result



## Initial situation Case 2 - Indirect Capping of 27

The 54-year-old female patient presented to our practice on 9/6/2021 with complaints relating to tooth 27. The vitality test using cold spray was positive and the X-ray also revealed a caries profunda. The clinical findings made indirect capping necessary. For this purpose, we also used the pulp capping material BisiCAL from bisico.

## Treatment Case 2

After removal of the caries profunda on tooth 27, which was also performed under local anaesthesia delivered to the terminal branches of the nerve, and without bleeding due to the localisation, cavity disinfection was performed with sterile cotton pellets and 3% sodium hypochlorite solution. We then indirectly capped the cavity with the pulp capping material BisiCAL, treated the cavity with Bisico E-Bond LC prior to composite placement and completed the treatment in a fairly short session to everyone's satisfaction (Figs 5 and 6).

In both cases, the occlusion was checked after the composite fillings had been cured, excess areas were reworked and finally a high gloss polish was applied. Both patients left the practice without complaints and were visibly satisfied.



situation after indirect capping



final care



At the follow-up appointment of each case eight weeks later, the patients reported that they were symptom-free. A renewed vitality test by means of cold spray was positive.

## Conclusion

Direct administration of BisiCAL by means of a syringe provides for hygienic and stress-free application, especially in the posterior molar region. Further positive properties of this pulp capping material are that it adapts well to the cavity wall and any excess is easy to remove.

Any stickiness on the instrument plays a minor role, as the material is supplied in a syringe and application with the filigree tip is easy to handle. The entire workflow can be easily integrated into the placement of the composite filling.

All in all, we found BisiCAL – The Calcium Patch for Pulp – to be very practical and we would highly recommend it.

**Dipl.-Stom. Ursula Bäßler**

Specialist in paediatric dentistry—

**Dipl.-Stom. Andres Bäßler**

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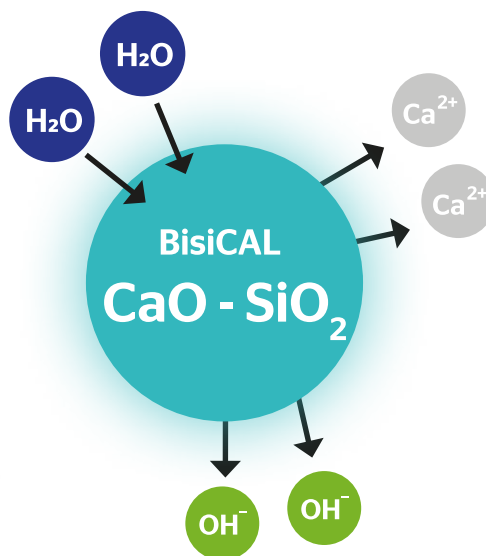
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