

Replacement of amalgam restorations using the SDR™ filling technique

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A 40-year-old patient, visiting the clinic for the first time, presented with amalgam restorations on teeth 14 to 17 (**Fig. 1a**). In consultation with the patient, it was decided to replace these with composite restorations, in order to achieve a good functional and aesthetic result. It was decided therefore to place restorations using SDR™ as a liner, which was capped by a layer of Ceram•X™ mono+ composite resin material.

Clinical case

The patient received local anaesthesia. While it was taking effect, the shade of the teeth was taken. It matched Vita* A3, corresponding to M5 within the Ceram•X™ mono+ system.

A rubber dam was applied for maximum protection against contamination.

After removing the amalgam and excavating the cavity, Palodent® matrices were put in place and secured with wedges (**Fig. 1b**).



Fig. 1a



Fig. 1b

One of the great advantages of SDR™ is its very low polymerisation shrinkage stress, which allows it to be applied in up to 4mm increments at a time. The material adapts to all cavity walls to form an even layer without air inclusions due to its low viscosity and self-levelling properties.

This has a number of significant advantages over the conventional composite build-up technique. The procedure is considerably easier, resulting in better and more reproducible high-quality restorations that can be placed in less time. The low polymerisation shrinkage greatly reduces the risks of postoperative pain and microleakage. Any conventional composite restorative material can be used for capping.

In the case presented here, we worked with Ceram•X™ mono+ by DENTSPLY. The favourable consistency of Ceram•X™ mono+ makes this material easy to shape and polish.

The teeth were etched with 35% phosphoric acid for a total etch time of 20 seconds for the enamel and 15 seconds for the dentine. After thorough rinsing with a gentle water spray, Tubulicide, primer and bond were applied successively. Any methacrylate-based bonding system is compatible with SDR™ and Ceram•X™ mono+.

We believe that it is not possible to create good contacts when two matrices are present in the same interdental space at the same time. We therefore chose to restore teeth 15 and 17 first.

SDR™ was first applied to tooth 15, guiding the applicator tip as far mesially as possible in the prepared cavity. This allowed the SDR™ to flow into the cavity under the pull of gravity. The self-levelling properties of SDR™ ensured optimum adaptation to the cavity walls. As soon as the material had formed an even layer, the

matrices were carefully placed with two instruments to provide the appropriate dimensions for tooth 15 (**Fig. 2a**). SDR™ was immediately polymerised for 20 seconds to prevent the composite from flowing distally. The same procedure was performed on tooth 18 (**Fig. 2b**).



Fig. 2a



Fig. 2b

Subsequently, Ceram•X™ was built up in teeth 15 and 17 in two layers. The first layer extended from the palatal cusps to the SDR™ lining substrate (**Fig. 3a**), the second layer from the buccal cusps to the first composite layer (**Fig. 3b**). Two layers were used to keep the shrinkage stress to a minimum. Moreover, this is a relatively simple way to achieve an anatomically correct result (**Fig. 3c**). After application of the Ceram•X™ mono+, the composite was first shaped with a modified cusp moulding instrument. A Sutter instrument was used to create the fissures. Finally, a small brush was used to make the outline as smooth and straight as possible.



Fig. 3a



Fig. 3b



Fig. 3c

The matrices of teeth 17 and 15 were carefully removed (leaving the wedges in place), whereupon teeth 14 and 16 were restored.

After inserting the SDR™ material (**Fig. 4a**) the matrices were again secured in place, this time so as to obtain good contacts (**Fig. 4b**).



Fig. 4a



Fig. 4b

Ceram•X™ mono+ was then applied as described for teeth 15 and 17 (**Figs. 5a to 5c**).



Fig. 5a



Fig. 5b



Fig. 5c

A scaler, a scalpel and interdental abrasive paper were used to remove excess material from the interdental embrasures (**Fig. 6a**).



Fig. 6a

To make the restorations look as natural as possible, the fissures were stained with an ochre and brown staining liquid. The staining liquid was applied with a very thin explorer (**Fig. 6b**), any excess was removed with a microbrush previously immersed in bond. The staining liquid was light-cured for 20 seconds.



Fig. 6b

Any remaining excess composite resin was removed with a polishing stone. The restorations were polished with an Occlubrush.



Before



After

Conclusion

The use of SDR™ has a number of obvious benefits in posterior restorations:

- SDR™ can be applied in layers up to 4mm in thickness, considerably speeding up and simplifying the treatment procedure.
- The low polymerisation shrinkage greatly reduces the risks of postoperative sensitivity, microleakage and secondary caries.

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