Endodontic restorations in one single step

DENTSPLY DeTrey’s Endo-Resto System in clinical practice

The Endo-Resto System by DENTSPLY DeTrey is a practical and comprehensive solution for endodontic restorative treatment. With the exception of gutta-percha and a conventional capping composite, the system includes everything necessary for placing a root canal filling and achieving a tight coronal seal. In addition to AH Plus Root Canal Sealing Material for the placement of the root filling and AH Plus Cleaner to remove excess of the sealer from the access cavity, it comes with a 36% phosphoric acid for conditioning the enamel and dentine, as well as the adhesive XP BOND and the flowable bulk-filling composite Smart Dentin Replacement (SDR).

With the Endo-Resto System, the endodontic filling and the definitive adhesive cap can be placed in a single session. Temporary closure is no longer required. Once the endodontic restoration has been placed, dentists can reconstruct the occlusal enamel layer with their composite of choice. In our case, we use Ceram-X (DENTSPLY), a nano-ceramic composite, which achieved excellent clinical results in our own studies conducted at the University of Freiburg.1

Available since 2010, SDR is the first posterior composite for dentine replacement that combines the easy handling of a flowable composite with minimal shrinkage stress.2 This allows the material to be placed and processed in increments of up to 4 mm in Class I and II cavities after the application of a conventional dentine or enamel adhesive.3 SDR is compatible with all methacrylate-based universal or posterior composites, which are used for the capping layer. All this translates into practical benefits, allowing high-quality aesthetic restorations to be delivered at a very reasonable cost.

SDR is characterised by reduced polymerisation shrinkage stress. A polymerisation modulator changes the viscous elastic behaviour of the material as stress starts to build up during polymerisation. Polymerisation stress is therefore reduced without any adverse effects on either polymerisation speed or conversion rates, which gives SDR the necessary physical and mechanical properties for it to be used as a flowable posterior base material in the bulk-filling technique. These modifications to the methacrylate chemistry ensure compatibility with the existing methacrylate-based adhesives and composites with which dentists are familiar and whose clinical performance is scientifically documented.

The existing indications for Class I and II cavities are augmented by further indications in endodontics. A study by Dr Johannes Ebert of the University of Erlangen-Nuremberg in Germany has shown that SDR is highly suitable and safe for direct adhesive coronal restorations after root canal obturation.4 Particularly in endodontics, the possibility of using 4 mm increments offers significant workflows benefits, given the depth of the access cavity. SDR is self-levelling, making it easy to introduce and less technique sensitive.

A study on Class I cavities has shown that SDR works very well even in cavities with an unfavourably high configuration factor.5 In this study, the SDR was the only one of the investigated materials suitable for bulk filling. In Class I and II cavities, SDR has been used successfully as well, which was documented by a prospective 24-month study.6

In our case, a 24-year-old female patient presented with pulpal symptoms that had developed several months after a Class II composite restoration had been placed. At her first visit, she reported spontaneous nocturnal pain and a strong sensitivity to cold. No other clinical symptoms were found besides those reported. The results of percussion and bite testing were negative. There was no apical tenderness on palpation. No periradicular lesion could be detected on the radiograph (Fig. 3). Irreversible pulpotis was diagnosed based on the clinical findings.

We discussed the planned procedure with the patient and obtained her consent. She was anaesthetised, and the access cavity was prepared under the dental microscope and then checked radiographically (Fig. 1). The gutta-percha master point (Fig. 2) was adjusted to a tight fit in the apical segment of the root canal and then checked radiographically for proper length and fit (Fig. 3). AH Plus residue (Fig. 4) from the access cavity was removed with AH Plus Cleaner (Fig. 5). After conditioning the tissue with 36% phosphoric acid (Fig. 6), the orange filter was activated on the dental microscope and XP Bond was applied (Figs. 6–10) and light cured. SDR was then placed in 4 mm increments (Figs. 11 & 12) and light cured. Finally, the cavity was restored with Ceram-X mono+ M2 as an enamel cap (Fig. 13). The endodontic filling was controlled radiographically (Fig. 14).

Conclusion

DENTSPLY DeTrey’s Endo-Resto System offers dentists a practical and time-saving system that includes all the materials, from the sealer to the bulk-filling composite. The major innovation in this system is clearly SDR. For the first time, low polymerisation stress combined with a high curing depth facilitate the use of a flowable composite base in the bulk-filling technique with up to 4 mm increments in Class I and II cavities.

The excellent sealing properties of the material are crucial in preventing reinfection, specifically in endodontic access cavities. The advantages over conventional composites concern with regard to handling can help save significant time. The self-levelling consistency of SDR ensures ideal adaptation to the cavity walls. Compatibility with existing methacrylate adhesives and composites, and delivery in one universal shade in Compula Tips simplify the workflow for economical high-quality aesthetic posterior restorations. As far as post-endodontic applications are concerned, the system could only benefit from a slightly longer metal cannula.

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Editorial note: A complete list of references is available from the publisher.

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