Endodontic restorations in one single step

DENTSPY DeTrey’s Endo-Resto System in clinical practice

By Prof. Jörg Schirrmeister

Germany

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 capping 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.

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. 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. 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 viscelastic 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 Eralingen-Nürnberg in Germany has shown that SDR is highly suitable and safe for direct adhesive coronal restorations after root canal obturation. Particularly in endodontics, the possibility of using 4 mm increments offers significant workflow 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. 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.

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 pulpitis 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. A pronounced isthmus between the mesiobuccal and distal canals were evident (Fig. 2).

Instrumentation was carried out using PathFiles and ProTaper Universal files (both DENTSPLY). The gutta-percha master point 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 with phosphoric acid (Fig. 6–8), Gutta-percha and AH Plus were introduced into the root cavity and AH Plus residue was left in the access cavity (Fig. 2).

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Instrumentation was carried out using PathFiles and ProTaper Universal files (both DENTSPLY). The gutta-percha master point 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). After conditioning with phosphoric acid (Figs. 6–8), the orange filter was activated on the dental microscope and XP Bond was applied (Figs. 4, 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

DENTSPY 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 cur-