Clinical case: Adhesive reconstructions from the root to the crown

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The following clinical case illustrates a complex treatment addressing various types of lesions in the posterior maxilla and mandible. In addition to the adhesive replacement of several restorations that had become deficient, secondary and occlusal caries as well as pulpitis of a posterior antagonist had to be treated. Adhesive restorative treatments were carried out with SDR® (Smart Dentin Replacement) and ceram.x® one DENTIN & ENAMEL composite in combination with Palodent® V3 Sectional Matrix System. The post-endodontic treatment was performed with prime&bond® one ETCH & RINSE, Self-Cure Activator and CoreX™ Flow, together with AutoMatrix® circumferential matrix bands (DENTSPLY).

Initial clinical situation
The patient presented for examination with suspected pulpitis of the upper right first molar (tooth 16). The clinical and radiographic examination of the tooth revealed extensive secondary caries below the pre-existing amalgam restoration and an endodontic lesion in the mesiobuccal root. Tooth 15 exhibited an inadequate endodontic treatment and a deficient composite resin filling with a radiologically evident lesion. Tooth 17 exhibited occlusal caries and tooth 18 was impacted (disodontiasis). Antagonists 46 and 47 in the mandible also exhibited deficient fillings that had to be replaced (Figs. 1 to 3).

Fig. 1 Baseline examination of teeth 17 to 15.
Fig. 2 Radiograph of teeth 17 to 15.
Fig. 3 Radiograph of teeth 17 to 15 with their mandibular antagonists 47 and 46.
Endodontic and restorative treatment - teeth 16 and 15

Treatment was initiated by removing the deficient amalgam restoration from tooth 16, which exposed a softened dentin floor and undermined dentinal walls (Fig. 4). This was followed by a complete pulpotomy and removal of carious tissue and undermined dentin (Fig. 5). The mesial wall of tooth 16 was reconstructed adhesively using ceram.x one DENTIN & ENAMEL composite resin together with the Palodont V3 Sectional Matrix System (Fig. 6). The defective restoration on tooth 15 was also removed and the adhesive reconstruction was performed using an Automatrix matrix band and ceram.x one DENTIN & ENAMEL (Fig. 7). The root canals of tooth 16 were cleaned, instrumented and three-dimensionally obturated, prior to the cavity being bulk filled with SDR and capped with ceram.x one DENTIN & ENAMEL (Fig. 8).
Post placement and core build-up on tooth 15
The root canal that was to accommodate the endodontic post (correct post size was previously determined by an intraradicular try-in post) was air-abraded and cleaned with polishing brushes. This was followed by etching of the root canal with phosphoric-acid etching gel for 15 seconds, then rinsing for at least 15 seconds along with the drying of excess moisture from within the canal. Prime&bond one ETCH & RINSE adhesive was mixed with the Self-Cure Activator for at least 2 seconds, introduced into the channel and left in place for 20 seconds. Once the excess adhesive had been removed and the solvent was evaporated, the post was cemented using CoreX Flow composite resin, which was applied directly into the root-canal lumen; it was also used to build up the coronal part of the core (Figs. 9 and 10).

Restorations on teeth 16, 17, 46 and 47
Tooth 16 was prepared (Fig. 11) and the indirect composite restoration was cemented in place (Fig. 12). Finally, teeth 17, 47, and 46 were restored directly. The clinical and radiographic examination performed at the control appointment showed the restorations to appear functional and aesthetic (Figs. 13 to 15).
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Conclusions
When restoring endodontically treated teeth by cementing a fiber post in place and building up an adhesive core, it is essential for the clinician to select a product range that ensures reproducible and long-lasting clinical results. DENTSPLY produces a full range of restorative products for the adhesive reconstruction of crowns and roots that renders the restorative procedure faster and standardised. The high quality of the DENTSPLY product range has been demonstrated in years of scientific research and by independent studies at renowned national and international universities.

For more information on SDR, Palodent V3, Automatrix, ceram.x one, prime&bond one or CoreX Flow please visit www.dentsplymea.com