Managing coronal destruction
A clinical case demonstrating the pre-endodontic reconstruction of a tooth

Fig. 1: Various preparations in a maxillary molar. — Fig. 2: A restoration covering the cusps with complete replacement of the occlusal surface. — Fig. 3: Various degrees of destruction of a root-filled anterior tooth. — Fig. 4: Clinical baseline findings: tooth showed a coronal fracture circumferentially at the level of the gingiva. — Fig. 5: Radiological baseline findings: intra-radicular radiopacity and apical radiolucency. — Fig. 6: Isolation of the working field with a rubber dam and preparation of the post bed. — Fig. 7: Conditioning of the cavity with 35% phosphoric acid. — Fig. 8: Working in the freshly mixed adhesive for 20 seconds. — Fig. 9: Filling the post cavity with LuxaCore Z-Dual. — Fig. 10: Insertion of the selected root post, which was previously covered with LuxaCore Z-Dual. — Fig. 11: Incremental build-up of the crown. — Fig. 12: Finished build-up of tooth 12 after contouring and polishing.

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For many years, post systems have been an important component of post-endodontic core build-ups. Post crowns or posts and cores used to be manufactured in a dental laboratory with the primary goals of repairing the restoration on significantly destroyed teeth and stabilising the tooth structure. With the development of adhesive systems, mechanical anchoring of the denture to the remaining tooth structure became increasingly less important, to such an extent that clinicians now debate whether a post is even needed.

Whether a tooth requires stabilization must be critically questioned as well, particularly in view of the risk of fracture and its causes. In this regard, root fractures, vertical root fractures and crown fractures have to be assessed differently. The risk of a fracture of the crown increases with the size and depth of the cavity being prepared in the tooth (Fig. 1).

A tooth with a mesial-occlusal-distal cavity (MOD) and an endodontic trepanation has a much higher risk of fracture than an undamaged tooth does.1 The risk of a cuspal fracture can be significantly reduced through a preparation covering the cusp for endodontically treated teeth with an MOD cavity (Fig. 2).2

Vertical root fractures differ from fractures in the area of the crown. Lost endodontically treated teeth owing to a vertical fracture are often treated with a post. The difference in the elastic modulus between the hard tooth structure and
The apical radiolucency should be 1–2 mm around the tooth. X-ray images showed a root filling up to approximately 3 mm before the radiological apex, as well as apical radiolucrency (Fig. 1). The retained root was cleared of remaining tissue, caries and plaque. Then the optimal post diameter was determined using a stencil. A size of 1.5 mm was selected.

Since there was only a small amount of remaining tooth substance, the post cavity was prepared to a depth of 6 mm and thoroughly rinsed. The canal and remaining exposed dentine were conditioned with 55 % phosphoric acid for 15 seconds and then rinsed with a multifunctional syringe for 15 seconds (Fig. 7).

Excess fluid was suctioned off with a micro-suction device. The pre-bond was applied using an application tip and worked into the surface for 15 seconds. The micro-suction device was again utilised to remove any excess.

In order to prepare the bonding material, Bond A and B were mixed in equal portions for 15 seconds and then massaged into the dentine surface for 20 seconds (Fig. 8). Then they were blown to a thin layer and light cured for 10 seconds. The tooth was built up with the dual-curing core build-up material LuxaCore Z-Dual (DMG Dental; Fig. 9) and the post cavity was filled with LuxaCore Z-Dual. The LuxaPost post (DMG Dental) was positioned and the material was light activated (Fig. 10).

The crown was built up in small increments, activated, and contoured and polished with diamond grinding tools (Figs. 11 & 12).

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

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