Strong, functional and reliable restoration

Sanjay Sethi describes how he uses a layered composite approach to successfully restore a difficult-to-access deep carious lesion

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A female in her early 30s attended the Square Mile Dental Centre for caries treatment. Four months previously, the patient's mesio-angulated, impacted, lower left wisdom tooth (LL8) was extracted due to food impaction. During an appointment prior to extraction, a deep carious lesion on the distal cervical aspect of the lower left second molar (LL7) was noted on X-ray (Figures 1 and 2).

Restoration of the lesion was planned to take place after the removal of the wisdom tooth, when better access was possible, and the extraction site had healed. The patient was not experiencing pain, as the lesion was predominantly under the gum line.

The composite restoration could be used as a base to provide deep margin elevation for an all-ceramic onlay

Good radiopacity

Restorative options were discussed with the patient. Due to the deep subgingival caries, limited mouth opening and difficulty accessing the tooth, a direct composite resin restoration was recommended, providing good isolation could be achieved. The choice of composite for this case was Kulzer Venus Diamond. It was important to use a composite material that featured good radiopacity for X-ray assessment.

The patient understood the complexity of the restoration, the potential depth, and risk of possible endodontic treatment. It was carefully explained that a cuspal coverage restoration would be required, if a root canal procedure was necessary. The composite restoration could be used as a base to provide deep margin elevation for an all-ceramic onlay, which could be bonded into place under rubber dam isolation.

Trauma minimised

To minimise unnecessary tooth structure loss and avoid traumatising the distal gingival tissue where possible, cavity preparation was completed using diamond burs, finished with ultrasonic tips and light air abrasion under rubber dam (Figures 3 and 4). The rubber dam was tucked into the sulcus and a sectional metal matrix ivory band was chosen, which facilitated a deep marginal seal of the cavity.

The low volumetric shrinkage and low shrinkage stress of the composite provided a reliable seal

However, due to the depth of the distal box, it was difficult to obtain a tight seal with the cavity box distal margin. Therefore, polytetrafluoroethylene (PTFE) tape was packed between the matrix band and the cavity margin to prevent any seepage or placement of the composite apical to the cavity margin (Figure 5).

The enamel was selectively etched with a high viscosity 37% phosphoric acid. After thorough rinsing and air drying, the cavity was bonded using a two-component self-etch technique, with a uni-dose primer and a uni-dose adhesive, according to the manufacturer's instructions.

Low incidence of chipping

Venus Diamond composite A2 and Clear (CL) shades were placed, with a layered approach, in no more than 2mm increments (Figure 6). The initial distal wall was built up with CL and set to convert the cavity from a class II to a class I configuration. Each layer was light cured for 20 seconds, and deeper increments for 40 seconds in accordance with the manufacturer's instructions.

Finally, a dark brown tint was used to match the light staining of the natural teeth. Once fully cured, the composite restoration was polished using diamond-impregnated, flexible polishing spirals – followed by a composite polishing brush.

Having used Venus Diamond for more than a decade, the author finds it to be a very reliable direct composite resin, displaying strength, good function, and radiopacity. The material has shown itself to be stable, strong, and durable, and has resulted in an extremely low incidence of chipping.

Challenges overcome

A successful and functional outcome was achieved in this case. The low volumetric shrinkage and low shrinkage stress of the composite provided a reliable seal (Figure 7), especially for such a deep restoration. The patient was delighted with the result, particularly as she was aware the tooth was treated under challenging circumstances. D

Figures 1 and 2: A deep carious lesion on the distal cervical aspect of the lower left second molar was noted on X-ray

Figures 3 and 4: Cavity preparation was completed using diamond burs, finished with ultrasonic tips and light air abrasion under rubber dam

Figure 5: PTFE tape was packed between the matrix band and the cavity margin to prevent any seepage or placement of the composite apical to the cavity margin

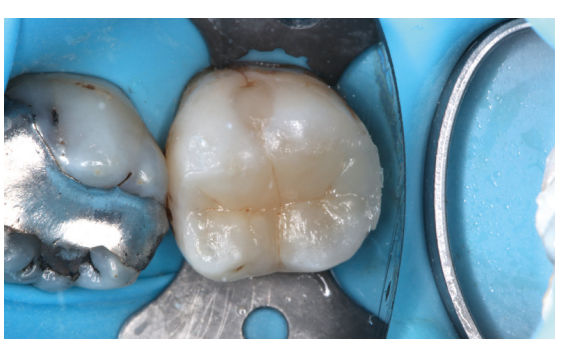

Figure 6: Venus Diamond composite A2 and Clear shades were placed, with a layered approach, in no more than 2mm increments

Figure 7: The low volumetric shrinkage and low shrinkage stress of the composite provided a reliable seal