

Predictable complex composite restoration

Clarence Tam¹

Introduction and chief complaint

The 52 year old patient presented to my service reporting unspecified sensitivity in his posterior 2nd quadrant of 1 month duration. The pain was primarily to cold stimuli with no intermittent or nocturnal pain or throbbing. He suspected and wanted tooth 24 extracted, as it had received a restoration from another dentist recently. No cellulitis was noted extraorally, and no paruli or draining fistula noted intraorally.

Soft tissue examination with probing in the 26-23 region revealed the deepest probing depth to be 3mm with bleeding. His 27 was missing. Cold tests were within the normal range for teeth 26-23 with no lingering reversible pulpitis noted. Tooth 26 was the only tooth not intact, with a fractured DOL aspect featuring deep recurrent caries. Indeed, this tooth featured 2-3 fragmented and defective composite restorations. Radiographic examination revealed the chronic nature of this deep-seated carious lesion on 26.

Description of treatment including rationale for choice of restorative material

The 52-year-old is a patient with poor dental attendance and financial contraindications. Treatment options were explained, including the lack of need for any extractions. Indeed, the most salient reason for sensitivity points to the deep, recurrent caries under the old comminuted composite restorations on 26MODL.

Considerations for restorative material

Ideal restorative options in this case revolve around bonded porcelain partial-coverage restoration, namely to increase and restore tooth stiffness. Financial constraints obviated this option, and thus a direct composite restoration was elected as a long-term provisional option. The restorative modality called upon would need to fulfil the criteria of minimal tooth preparation yet exhibit the strongest compressive and flexural strengths. If bonded lithium disilicate was not a financially-viable solution, the composite chosen would need to exhibit ultra-high filler particle density, minimal polymerization contraction, excellent modulus of elasticity and surface hardness.

Treatment description

Following administration of local anaesthesia, the 2nd quadrant was isolated with a 12A rubber dam clamp and a non-latex rubber dam. The WedgeGuard (pink) was inserted, and the preparation completed. Caries was removed using Caries Detector Dye (Kuraray) as a guide along with tactile feedback. The preparation was finished by bevelling the enamel 15 degrees on the residual buccal wall to increase surface area for bonding. An Omnimatrix (Ultradent) was fitted, with a WaveWedge placed mesial to tooth 26 to seal the margin. It is important to understand the function of the

¹ Dr Clarence Tam, HBSc, DDS
Cosmetic and General Dentistry
Auckland (New Zealand)

E-mail: clarence.tam@gmail.com
www.clarencetam.co.nz

Clinical Case



Figure 1: Pre-operative situation: multiple "patch" restorations with massive leakage and deep recurrent caries pulpally.



Figure 2: Intraoperative view during excavation of caries.



Figure 3: Construction of the distal marginal ridge and restoration of the proximal box simultaneously.



Figure 4: To ensure a solid mesial interdental contact and accurate reproduction of emergence profile, the Triodent V3 matrix system and Wave Wedge was paired with a SuperCurve matrix band.

Omnimatrix as a matrix technique for the distal aspect of 26 only. Use of this matrix for mesial wall reconstruction inevitably may lead to a straight emergence profile, undercontoured contact region, and excess material in the occlusal embrasure, not to mention a real possibility of an open contact if adequate wedging force is not applied.

Tooth 26 was etched with 33% H₃PO₄ (aq) before application of Optibond Solo Plus (Kerr Corp.), air-thinned for 10 seconds and light-cured. The distal marginal ridge was built up incrementally using Grandio (VOCO) and the Omnimatrix removed. The Wave-Wedge (pink) was left in place to protect the papilla as the SuperCurve Blue (5.5mm)

matrix was slid into position. The V3 ring (Green Universal) was used in this molar case for predictable contact strength and morphology. The mesial marginal ridge was also constructed using incremental placement of Grandio. The V3 sectional apparatus were removed and the occlusal aspect restored after confirmation of mesial contact strength. Individual lobes were fashioned incrementally taking C-Factor stresses into account. Small lobe-specific increments allowed for a minimization and optimization of an already-low polymerization contraction figure (1.61%). Final polishing was completed using Dimanto (Voco), a single-stage ultra-high shine polishing system specific to Grandio.



Figure 5: Post-contoured, pre-finished view of 26.



Figure 6: Post-finishing and polishing, before occlusal checks.



Figure 7: Immediate post-operative situation after occlusal fine-tuning.



Figure 8: Immediate post-operative periapical radiograph showing complete removal of caries, well sealed margins and impressive radioopacity from Grandio.

Rationale for choice of restorative material

For the patient, principal factors in material selection revolved around preservation of residual healthy tooth structure and enamel for bonding, coronal restrengthening and esthetic predictability.

In this case, the patient did not have financial liberty, obviating the bonded porcelain restorative solution that

would be ideal for coronal restiffening and best long-term prognosis. The beauty of resin bonding is maximum conservation of tooth structure with maximum esthetic outcome if the restorative technique is correct, not to mention low-cost of maintainability over time. In this case, the buccal wall of the tooth has not been significantly compromised, and thus merely added to.