

Cusp replacement restoration on tooth 26

Jean van Lierop¹

About the case

Upper left first molar (tooth 26). The patient presented with sensitivity and discomfort on biting on the upper left. On examination, the 26 showed a mesial fracture with a cracked mesiobuccal cusp, and the radiograph revealed secondary decay in the mesial area beneath the existing restoration.

The treatment decision was to replace the failing restoration and overlay the cracked mesiobuccal cusp — incorporating it into the new restoration for support rather than leaving the crack to propagate. A direct composite restoration using Tetric N-Plus, bonded with Tetric N-Bond and shaped with the Garrison Strata-G sectional matrix system.

Step-by-step + key points

- 1. Isolation** — The tooth was isolated with rubber dam for a clean, moisture-controlled field.
- 2. Caries removal & cusp reduction** — The old restoration was removed and the secondary decay fully excavated. The mesiobuccal cusp was reduced by ~1 mm to overlay and protect the cracked segment.
Key point: overlaying the compromised cusp reinforces it instead of leaving a crack to fail later.
- 3. Surface prep & bonding** — The preparation was cleaned of all residual decay and then sandblasted with 50 µm aluminium oxide to create an optimal bonding surface, before being bonded with Tetric N-Bond..
- 4. Matrix setup — Garrison Strata-G** — A 5.5 mm sectional band, green extra-wide sectional ring, and small yellow wedge sealed the cervical margin and set up the ideal emergence profile.
Key point: the band's aggressive curvature builds predictable, natural contour and a tight 3D contact — and the tab points directly at the future contact point.
- 5. Mesial box — bulk flowable** — The mesial box was filled first with a bulk-fill flowable (Tetric N Power Flow 2).
- 6. Rebuild the marginal ridge** — The mesial marginal ridge was rebuilt and shaped with Tetric N-Plus to establish the ideal contact and ridge — only the marginal ridge at this stage, not the cusp.
- 7. Rebuild the MB cusp separately** — With the ridge set, the ring was removed and the mesiobuccal cusp was accessed and rebuilt directly.
Key point: separating this step gives far better access and a more predictable cusp shape.
- 8. Occlusal bulk** — The bulk of the occlusal defect was filled with the bulk-fill flowable (Tetric N Power Flow 2).
- 9. Capping layer & anatomy** — A final capping layer of Tetric N-Plus was carved with LM instruments (LM condenser and fissura) to sculpt ideal anatomy.
- 10. Finish** — Occlusion checked, finished and polished to a functional, natural-looking result. When the treatment was complete, the inlays integrated well into the natural environment.

Summary

A strong, natural-looking restoration with anatomy built for predictable, ideal function — and the cracked cusp protected under an overlay. Building the marginal ridge and the mesiobuccal cusp as separate steps gave better access and a more controlled result, while the Garrison Strata-G system delivered a tight, anatomically correct contact and clean cervical seal.

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Fig 1: **Preoperative:** mesial fracture with a crack line through the mesiobuccal cusp on the existing restoration.



Fig 2: **Isolation:** sectional rubber dam placed for a clean, dry field.



Fig 3: **Old restoration partially removed:** initial decay cleaned out.



Fig 4: **All decay and unsupported structure removed:** MB cusp reduced 1 mm for a cusp overlay; mesial box shaped while chasing the crack line and assessing its extent.

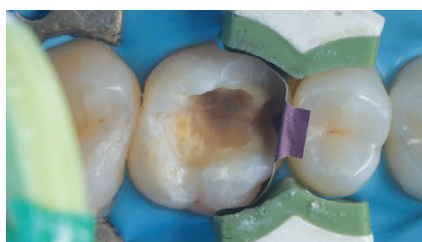


Fig 5: **Matrix placed:** Garrison Strata-G band + green ring; tab positioned at the ideal N-Bond contact point, ring supporting the band without distortion.



Fig 6: **Bonding:** universal adhesive (Tetric N-Bond) applied to enamel.

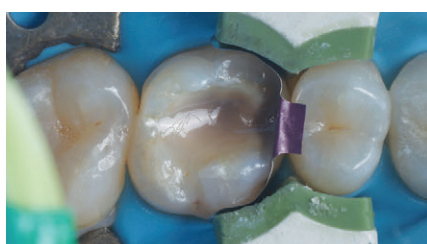


Fig 7: **Mesial box sealed:** Tetric N Power Flow 2 seals the box and fills the deeper areas of the cavity.



Fig 8: **Marginal ridge built:** with Tetric N-Plus — MB cusp intentionally left for later.



Fig 9: **MB cusp rebuilt:** with direct access after the ring was removed.



Fig 10: **Capping layer:** occlusal and lateral MB completed in a single layer of Tetric N-Plus, shaped with LM instruments.



Fig 11: **Finished and cleaned**



Fig 12: **Final result:** after occlusal check and final polish.