

The best solution: One more overlay.

Prof. Angelo Putignano

The step-luting technique optimizes the cementation of indirect restorations using dual-cure resin cement, addressing a critical phase in restorative procedures. A 5-second light cure stabilizes the restoration while maintaining the cement in a gel-like state for easy excess removal. After a 20-second wait, a final 40-second light cure ensures complete polymerization, enhancing bond strength and marginal adaptation. The self-curing component guarantees polymerization even in areas with limited light exposure. This technique improves clinical efficiency, reduces stress on the restoration, and ensures long-term stability.

The following clinical case demonstrates the step-by-step fabrication and cementation of an overlay on an endodontically treated molar with a faulty composite restoration.



About Prof. Angelo Putignano



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- Prof. Putignano is lecturing internationally on adhesive & aesthetic restorations.

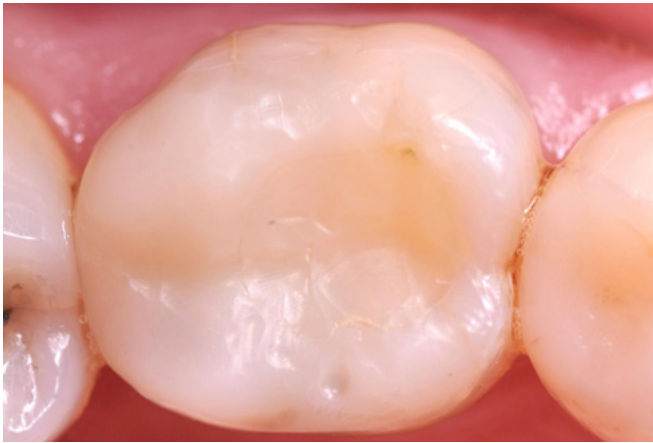


Fig. 1 - Initial situation. The patient showed an old unaesthetic composite reconstruction with several cracks on lower first molar. With the compliance of the patient, the treatment plan involved the replacement of the existing composite restoration with an indirect one.

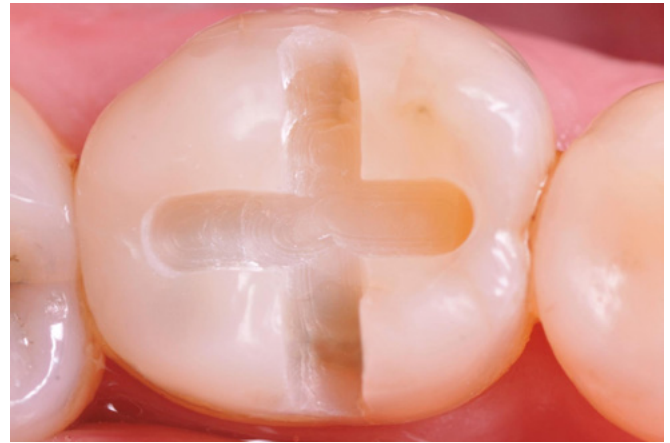


Fig. 2 - Guide for occlusal reduction. A cross was created to serve as a guide for occlusal reduction and the subsequent preparation for an overlay, utilizing a diamond cylindrical bur. It is preferable to initiate the preparation in the central fossa, progressing along the sulcus in order to achieve an even 2 mm of occlusal reduction in the deepest part. secured with ligatures.



Fig. 3 - Preparation steps. First reducing the occlusal surface, followed by the interproximal areas.



Fig. 4 - Finalized tooth preparation. Finalized tooth preparation with a smooth, rounded surface, free of interproximal boxes and sharp angles.

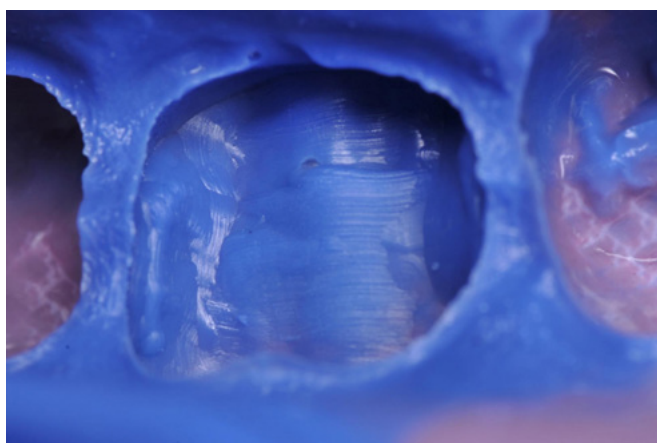


Fig. 5 - Conventional impression taking.

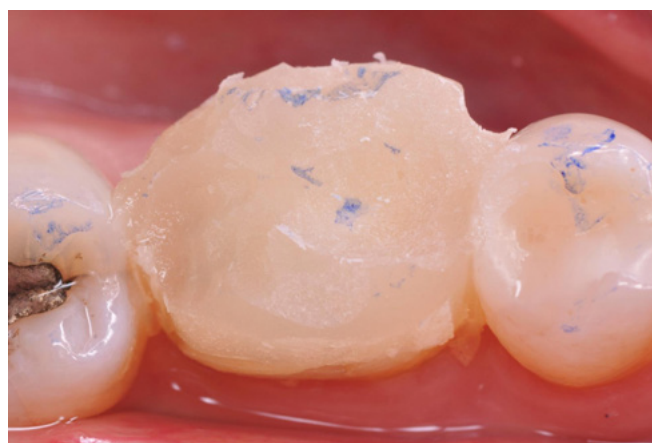


Fig. 6 - Provisional placement. For the provisional restoration, Telio material was applied to cover and protect the preparation while awaiting the fabrication of the definitive indirect restoration. It is essential to verify stability and occlusion before dismissing the patient.



Fig. 7 - Fabrication of the indirect restoration.



Fig. 8 - Rubber dam placement. Following provisional removal, the rubber dam was applied to initiate the cementation of the indirect restoration.



Fig. 9 - Air abrasion. The tooth was air-abraded to clean the surface using AcquaCare (Velopex International) with 50 µm aluminum oxide, following the Style Italiano protocol.



Fig. 10 - Etching. The indirect restoration was conditioned according to protocol. First, 9% hydrofluoric acid was applied for 20 seconds and then rinsed off. In addition, to ensure a clean intaglio surface and remove residues, additional etching was performed with 37% phosphoric acid for one minute. Silane was then applied with a brush and air-dried to facilitate alcohol evaporation.

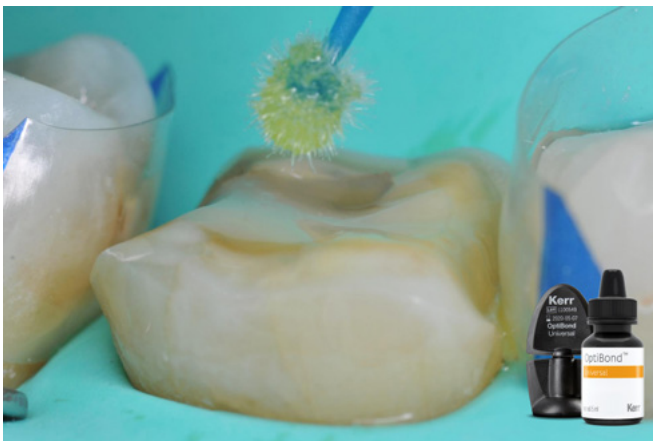


Fig. 11 - Bonding. OptiBond Universal (Kerr) was applied into two layers on both the onlay intaglio surface and the tooth preparation with thorough rubbing and scrubbing. This was followed by air-blowing for 20 seconds.



Fig. 12 - Cementation. After that, NX3 Nexus Third Generation (Kerr) luting cement was applied, and the onlay was immediately set onto the tooth.

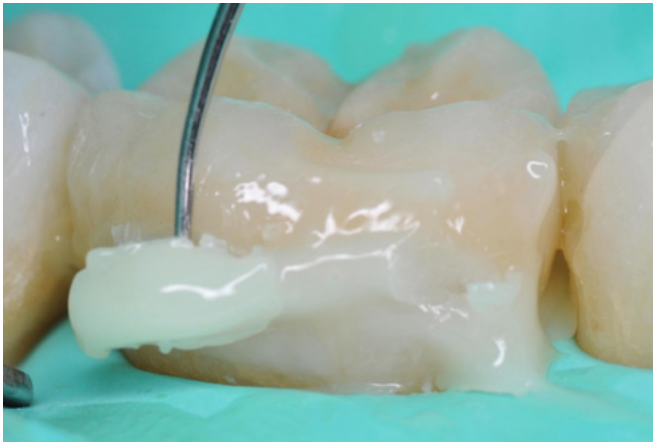


Fig. 13 - Step curing technique. The 'step curing' technique allows for the controlled removal of excess material while it is still soft, making it easier to clean up the margins. Initially, the resin cement was light-cured for about 5 seconds to slightly harden the material, allowing the clinician to easily remove the soft excess around the margins of the restoration using a fine instrument (LM-Fissura, LM-Arte).



Fig. 14 - Removal of the excess. Using the Eccesso instrument from the LM-Arte kit and dental floss, it is possible to easily remove excess cement before it fully hardens. This approach ensures a safe and efficient cleanup of the restoration margins.

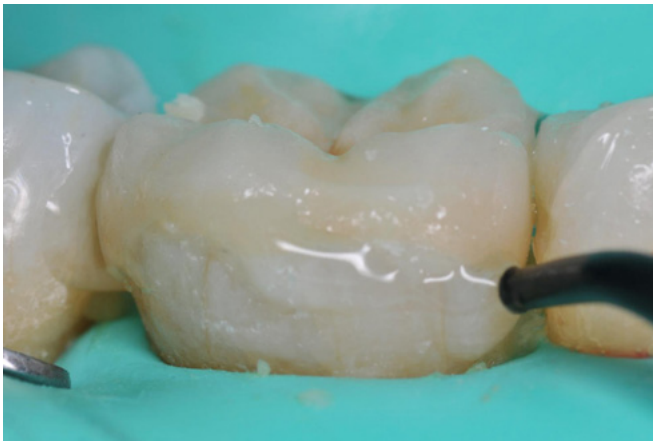


Fig. 15 - Final polymerization. After cleaning up the excess material, a glycerine was applied to ensure a complete degree of conversion of the resin cement material. Thus, the final polymerization was completed with an additional 40 seconds of light-curing.



Fig. 16 - Polishing. The restoration-tooth interface was carefully polished using a brown rubber polisher to enhance both the aesthetic outcome and the properties of the resin cement.



Fig. 17 - Occlusal adjustment. Once the rubber dam was removed, occlusal adjustments were carefully verified to ensure proper stability and function.

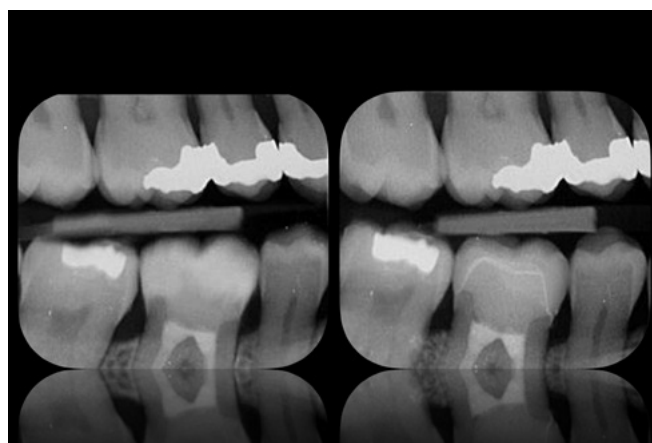


Fig. 18 - Radiographic examination. First lower molar radiographic examination, before and after.

Conclusion

The successful outcome of this clinical case highlights the importance of proper preparation design and precise cementation protocols in ensuring the longevity and functionality of the restoration. The step-luting technique, combined with the use of a dual-cure resin cement, allowed for controlled polymerization, optimizing bond strength and marginal adaptation. Additionally, careful occlusal adjustments and stability verification were essential to achieving a predictable and durable result. This approach simplifies the cementation phase, minimizing stress on the restoration while enhancing clinical efficiency.

Bibliography

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