INDIRECT ADHESIVE RESTORATION PROCEDURES IN THE POSTERIOR REGION:

THE POWER OF UNIVERSAL WORKFLOWS

CLINICAL CASE REPORT BY VÍCTOR HENAREJOS DOMINGO - DDS, MSC

Contemporary indirect restorative dentistry is moving towards increasingly efficient, digital, and simplified protocols. The integration of CAD/CAM technologies with universal materials allows for the optimization of clinical procedures, reduces surgical complexity, and increases the predictability of restorative treatments. State-of-the-art resin-based hybrid materials, combined with self-adhesive resin cements and universal adhesives, provide excellent mechanical and aesthetic properties, whilst also offering simpler and less technique-sensitive cementation protocols than conventional restorative procedures.

The present clinical case demonstrates the combined use of CLEARFIL MAJESTY™ ES Flow Universal Low (UD), KATANA™ Cleaner, CLEARFIL™ Universal Bond Quick 2, KATANA™ AVENCIA™ Block 2, PANAVIA™ SA Cement Universal, and the TWIST™ DIA for Composite polishing system (all products: Kuraray Noritake Dental Inc.) in the adhesive rehabilitation of an endodontically treated second molar.

Figure 1 (and image on the left page): Initial condition of the lower right second molar. Note the extensive destruction of the coronal portion.

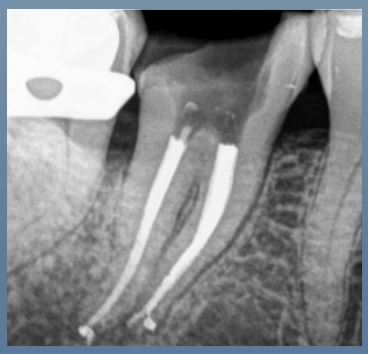


Figure 2: Clinical and radiographic evaluation of the affected molar following completion of endodontic treatment and prior to reconstruction of the lost tooth structure.

Figure 3: Immediate build-up performed with CLEARFIL MAJESTY™ ES Flow Universal Low (UD). Note the appropriate regularization of the substrate for subsequent preparation of the adhesive overlay.

CASE DESCRIPTION

A 48-year-old female patient presented in the clinic with severe coronal destruction of her mandibular right second molar (tooth #47, FDI notation), associated with symptoms and endodontic treatment that had previously been initiated at another clinic. Following clinical and radiographic evaluation, it was decided to complete the root canal treatment and restore the tooth with an adhesive overlay produced using CAD/CAM technology (Fig. 1).

Following completion of the endodontic treatment, the remaining tooth structure needed to be stabilised to provide a stable foundation for the planned overlay (Fig. 2). Selective enamel etching was performed using K-ETCHANT Syringe, a 35 % phosphoric acid gel offering precise application and controlled consistency, followed by the application of CLEARFIL™ Universal Bond Quick 2. The build-up was then completed using CLEARFIL MAJESTY™ ES Flow Universal Low (UD), a highly filled universal flowable composite with excellent mechanical properties, particularly suitable for posterior restorations subjected to functional loading (Fig. 3).

Subsequently, the tooth was prepared for an adhesive overlay under rubber dam isolation, following a defect-oriented and minimally invasive approach (Fig. 4). Digital impressions were then taken using a TRIOS 5 intraoral scanner (3Shape) (Fig. 5). Following computer-aided design of the restoration, the overlay was milled using a KATANA™ AVENCIA™ Block 2 in the high-translucency variant (HT). This translucent resin-based hybrid ceramic CAD/CAM block is specifically indicated for posterior partial restorations. It is characterised by high mechanical strength, excellent optical integration, and rapid polishability (Fig. 6).

Figure 4: Anatomically guided preparation for an adhesive overlay. Note the preservation of sound tooth structure and the well-defined margins for subsequent impression taking.

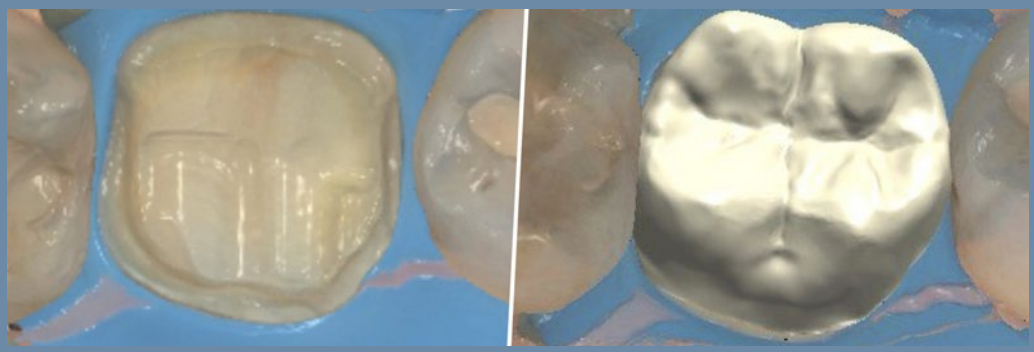


Figure 5: Digital impression taking and computer-aided design of the restoration.

Figure 6: Overlay milled from KATANA™ AVENCIA™ Block 2 HT. Note the anatomical characterisation supporting an excellent aesthetic integration.

Figure 7: Operative field isolated with rubber dam prior to adhesive cementation of the produced overlay.

Figure 8: Chemical treatment of the overlay's internal surface by airborne-particle abrasion with aluminium oxide, followed by decontamination with KATANA™ Cleaner.

One week later, during the definitive cementation appointment (Fig. 7), both the internal surface of the restoration and the tooth substrate were decontaminated using KATANA™ Cleaner. This universal cleaner contains MDP Salt (based on MDP technology), capable of effectively removing saliva and blood contamination both intra-orally and extra-orally in just ten seconds (Fig. 8). The goal was to optimize adhesion for predictable and durable adhesive cementation.

Selective enamel etching was then repeated using K-ETCHANT Syringe, followed by the application of CLEARFIL™ Universal Bond Quick 2. This next-generation universal adhesive is distinguished by its simplified protocol, requiring short application time and no waiting after that, whilst providing excellent wettability and durable adhesion to both enamel and dentin (Fig. 9).

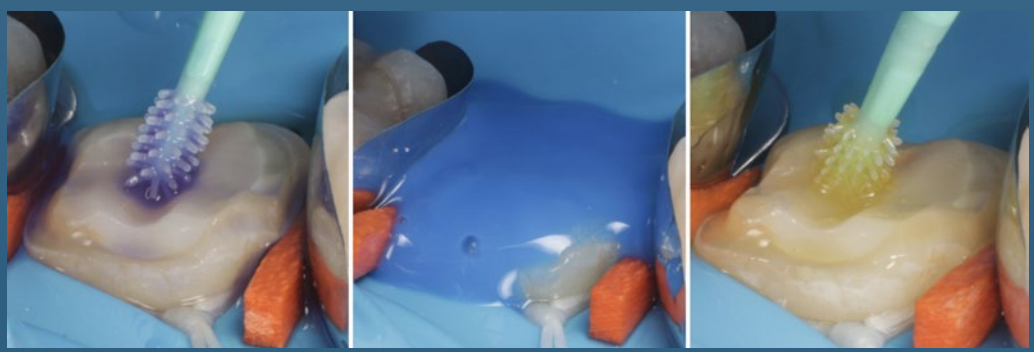


Figure 9: Decontamination of the tooth structure using KATANA™ Cleaner, followed by enamel etching and the application of CLEARFIL™ Universal Bond Quick 2. Note the simplified adhesive protocol.

Figure 10: Definitive adhesive cementation of the overlay using PANAVIA™ SA Cement Universal Automix (Universal – A2). Note the accurate adaptation of the restoration and controlled application of the cement during final seating.

Figure 11: Removal of excess cement following tack curing of PANAVIA™ SA Cement Universal Automix.

Figure 12: Principal products used throughout the restorative procedure, following Kuraray Noritake Dental Inc.'s "Universal Excellence" concept.

Definitive cementation was carried out using PANAVIA™ SA Cement Universal Automix (Universal – A2). The selected universal self-adhesive resin cement features both the MDP monomer and the innovative LCSi silane, enabling durable chemical adhesion to zirconia, composites, and ceramics without the need for additional primers. The product offers ease of handling and a straightforward removal of excess material: An initial two to five-second light-curing protocol supports a rapid, clean, and controlled, removal of excess cement, facilitating clinical handling and optimising the adhesive cementation procedure (Figs. 10, 11 and 12). The combination of KATANA™ Cleaner, CLEARFIL™ Universal Bond Quick 2, and PANAVIA™ SA Cement Universal enables a simplified, efficient, and highly predictable workflow, reducing both the number of components and clinical steps without compromising bond quality or restoration longevity.

Finally, the occlusion was adjusted and the surface of the restoration polished using TWIST™ DIA for composite. The two-step diamond polishing system is capable of rapidly delivering a natural and long-lasting gloss on both direct and indirect restorations (Figs. 13, 14 and 15).

Figure 13: Final polishing of the restoration using the TWIST™ DIA for Composite system.

Figure 14: Lateral view immediately following adhesive cementation of the hybrid ceramic overlay. Note the excellent marginal, anatomical and optical integration.

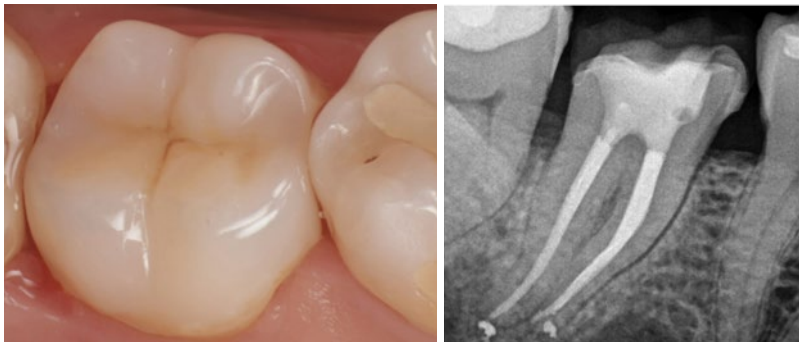
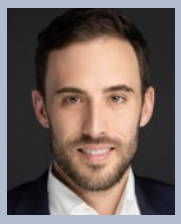


Figure 15: Clinical and radiographic review one month after adhesive cementation.

CONCLUSIONS AND CLINICAL IMPLICATIONS

The incorporation of universal materials into digital restorative protocols supports simplification of indirect adhesive procedures whilst optimising clinical efficiency and reducing technique sensitivity. The combination of CAD/CAM restorations with universal adhesives and cements facilitates conservative, efficient, and highly predictable treatment approaches, fully aligned with the demands of contemporary restorative dentistry.

Supporting Literature: 1. Tian F, Jett K, Flaugher R, Arora S, Bergeron B, Shen Y, Tay F. Effects of dentine surface cleaning on bonding of a self-etch adhesive to root canal sealer-contaminated dentine. J Dent 2021;112:103766. **2.** Breschi L, Van Meerbeek B. Editorial: Universal adhesives – to etch or not to etch? J Adhes Dent 2021;23(4):283. **3.** Breschi L, Maravic T, Mazzitelli C, Josic U, Mancuso E, Cadenaro M, Pfeifer CS, Mazzoni A. The evolution of adhesive dentistry: From etch-and-rinse to universal bonding systems. Dent Mater 2025;41(2):141–158. **4.** Maravić T, Mazzitelli C, Mancuso E, Del Bianco F, Josić U, Cadenaro M, Breschi L, Mazzoni A. Resin composite cements: Current status and a novel classification proposal. J Esthet Restor Dent 2023;35(7):1085–1097. **5.** Sulaiman TA, Abdulmajeed AA, Altitinchi A, Ahmed SN, Donovan TE. Mechanical properties of resin-based cements with different dispensing and mixing methods. J Prosthet Dent 2018;119(6):1007–1013.



About the author

Dr. Victor Henarejos-Domingo, DDS, MSc, is a prosthodontist based in Barcelona, Spain, and an Associate Professor in the Department of Restorative Dentistry at the Universitat Internacional de Catalunya. He holds a Master's Degree in Aesthetic Restorative Dentistry and a postgraduate diploma in Endodontics from the University of Barcelona. Dr. Henarejos is also actively involved in research and has authored numerous scientific publications in international journals focused on restorative and digital dentistry. He is an invited lecturer and course instructor, delivering training programmes for dental professionals both nationally and internationally, with a strong focus on restorative dentistry, digital workflows, and adhesive techniques.