

Bonding Protocol for Zirconia Restorations

A simple guide to success!

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As with many other things in dentistry, advancements in bonding technology have created different options with specific indications for dentist to use.

As we are all aware, bonding is technique sensitive and selecting the correct protocol is crucial for successful restorations. In this clinical report, we are going to present two different bonding protocols: total etch/dual cure and self-etch/dual cure options and outline some clinical recommendations for each one.

Materials used: ONE COAT 7 UNIVERSAL, One Coat 7 Activator, DuoCem, SoloCem.

Case report

A 62-year-old female was referred to the

clinic for a comprehensive evaluation. At the initial appointment, she expressed being “unhappy” with her smile mainly due to the asymmetry in size and the existence of margin stains on her 20+ year old restorative work. (Figure 1). An intraoral examination revealed porcelain veneers from 6-11 with the exception of tooth No. 9 that presented a PFM crown. Some posterior teeth presented large MOD amalgams and No. 14 a gold onlay. The PFM on tooth No. 9 was loose and attached to an intracoronal metal post. A TMJ evaluation revealed no pain or tenderness to palpation of the inferior belly of the inferior lateral pterygoid muscle, and no clicking or popping of the joints. A treatment plan for full maxillary rehabilitation that included esthetic clinical crown lengthening and a root canal re-treatment on

tooth No. 9 with post-and-core was presented to the patient and accepted with the exception of removing the gold onlay crown present on tooth No. 14. Preliminary impressions and a facebow were obtained, and casts were mounted in centric relation on a semi-adjustable articulator for a diagnostic wax-up (Figure 2). After finishing and verifying the wax-up, an esthetic clinical crown lengthening procedure from 3-13 was performed (Figure 3). Final preparations were completed, and impressions obtained 6 months post-surgical procedures (Figure 4). Full contour zirconia crowns were selected for final restorations in this case due to its strength and highly esthetic characteristics.



Fig. 1: Pre-operative view. Note the uneven gingival architecture and un-esthetic appearance.



Fig. 2: The diagnostic wax-up should incorporate ideal proportions.



Fig. 3: Post clinical crown lengthening procedure. Note the new position on the gingival zenith for all anterior teeth.



Fig. 4: Day of final impressions. A double cord technique is being used. Note the periodontal health, a must for ideal impression.



Fig. 5: Full contour translucent zirconia crowns ready for delivery.



Fig. 6: Retracted view of completed restorations. Note the ideal contours and texture for a natural appearance.

Cementing the restorations:

Once the restorations were received from the lab (**Figure 5**) the patient was scheduled for delivery appointment. Local anesthesia of the site was completed, and a split rubber dam isolation achieved. The ceramic restorations were sandblasted with 30um aluminum oxide, cleaned (ultrasonic) and a zirconia primer applied to the intaglio surface. Both self-etch (SoloCem) and total-etch (DuoCem) techniques were chosen for this case; self-etch for all restorations except for the “onlay” preparations on teeth No. 3, 5, 12 (see **figure 4**). Total-etching of the circumferential enamel and dentin present greatly benefits bonding, especially for teeth with less than ideal clinical crown height.

SoloCem/Self-etch:

A single retraction cord is placed around the prepared teeth to control crevicular fluid and to avoid resin cement from flowing underneath the gingival margin. SoloCem self-etching/self-adhesive dual-cure resin cement was mixed using the auto-mixing tip and delivered directly onto the intaglio surface of the restoration. Seating of the restoration using firm finger pressure onto the prepared tooth surface was accomplished, followed by tack-cure (3-5 seconds) of the margins, removal of the excess and a full cure mode of 20 seconds per surface.

DuoCem Total-etch:

For teeth No. 3, 5, 12, a first layer of ONE COAT 7 UNIVERSAL was applied onto the prepared surface of the teeth followed by a second layer on ONE COAT 7 UNIVERSAL combined with its activator (1:1 ratio). This second layer acts like the hydrophobic resin which provides the bonding layer to the restorative material. DuoCem dual-cure resin cement was mixed using the auto-mixing tip and delivered directly onto the intaglio surface of the restoration. Seating of the restoration follows the same instructions as described above.

Figure 6 shows a retracted view of the completed restoration, **Figures 7, 8 and 9** shows a smile view of the 30 days follow-up.

Conclusions:

As we all know, every patient that presents to our clinic has its unique clinical characteristics. Some teeth are vital and have enough remaining tooth structure that self-etching/self-adhesive resin cements work very well. On the other hand, we may have a situation where the remaining tooth structure is minimal and combining total-etching with dual-cure resin cements is necessary to have a good prognosis. For every clinical situation we have a specific protocol which can simplify our decision making.

BIO

Dr. Mario Romero is an Associate Professor and Director of the Advanced Education in General Dentistry Program at The Dental College of Georgia at Augusta University; he is a 1995 graduate from the University of Guayaquil School of Dentistry in his native country of Ecuador. He completed a two-year Advanced Education in General Dentistry Program at the University of Rochester, Eastman Institute for Oral Health where he was granted the Handleman Award for Excellence. In 2016 Dr. Romero was awarded the Augusta University and the American College of Dentists Outstanding Faculty award for his achievements in scholarly, research and service. In 2018 he received the Research and Scholarship award from the Dental College of Georgia for his contributions to dentistry and in 2019 he received the Excellence in Dental Education Award from the Pierre Fauchard Academy. He has over 40 publications in national and international peer reviewed journals and has lectured extensively on topics related to direct and indirect restorative dentistry. He maintained a private practice with emphasis in Esthetics and Restorative Dentistry for 15 years prior to joining AU in 2013.

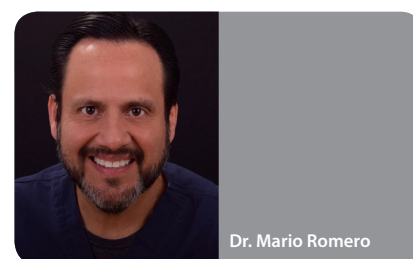


Fig. 7: Frontal view 30 days after delivery.



Fig. 8: Left view 30 days after delivery.



Fig. 9: Right view 30 days after delivery.

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