

3M[™] Health Care Academy

Simplified cementation of glass ceramic restorations.

by Prof Paulo Monteiro, Portugal.

Date of Original: November 2018 - 3M Dental Magazine

Is it possible to simplify indirect anterior restoration procedures without compromising restoration longevity and aesthetics? According to my personal experience and scientific studies, it is – provided that suitable materials are used. A material combination that has proven its worth in the context of placing glass ceramic restorations in a simplified way is 3M[™] Scotchbond[™] Universal Adhesive and 3M[™] RelyX[™] Ultimate Adhesive Resin Cement¹⁻³. It is well-suited for both retentive and non-retentive preparation designs.

Efficiency and simplicity are increased as only two components are required to obtain a strong and durable bond: the single-bottle universal adhesive and the adhesive resin cement. The adhesive works well with selective enamel etching preferred by me, but also in the total-etch and self-etch modes. Containing active and stable silane, it also works as a glass ceramic primer. In addition, it incorporates a dark cure activator for RelyXTM Ultimate resin cement. The following clinical case is used to illustrate the simplified procedure and provide evidence for the great long-term performance of the selected materials.



Figure 1: A 21-year old female patient (dental student) presented in our dental office telling us that she was unhappy with the existing composite restorations on her maxillary central incisors. The restorations had already been replaced several times due to fractures and discolouration.



Figure 2: The patient expressed the desire to receive restorations that are stable over time and highly aesthetic. The clinical examination revealed that both teeth were vital. After additional assessment of the situation on X-rays, it was decided to remove the old restorations and see what kind of and how much of the tooth structure would be left.

Figure 3: The old restorations were removed and, as large amounts of enamel were still available, it was decided to opt for a conservative preparation and place a crown and a veneer made of feldspathic porcelain.

Figure 4: Situation after tooth preparation: Most of the structure is still covered by sound enamel favourable for adhesive restoration procedures.

Figure 5: Feldspathic crown and veneer ...

Figure 6: ... on the model.

Figure 7: The restorations have a very high translucency.

Figure 8: Crown ready for try-in.

Figure 11: Try-in of the crown and veneer: Both restorations are highly aesthetic.

Figure 9: Veneer ready for try-in.

Figure 12: Conditioning of the restorations' intaglio surface with hydrofluoric acid gel (PORCELAIN ETCHANT, 9.5% HF, Bisco) for 90 seconds. The etchant was then suctioned, thoroughly rinsed off with water and the surface dried with water and oil-free air.

Figure 10: Application of $3M^{\rm w}$ RelyX $^{\rm w}$ Ultimate Try-In Paste (Translucent) into the veneer.

Figure 13: Use of 3M[™] Scotchbond[™] Universal Adhesive on the etched ceramic surface. The universal adhesive contains active silane, eliminating the need for additional silane application. It should be allowed to react with the substrate for 20 seconds and treated with a gentle stream of air to ensure that the solvent evaporates completely. Visual control is possible: the adhesive layer will no longer move when the solvent is gone. Light curing is not required.

Figure 14: Isolation of the working field with rubber dam for the adhesive cementation procedure.

Figure 17: Etching of the enamel on the maxillary left central incisor with phosphoric acid (3M[™] Scotchbond[™] Universal Etchant) for 30 seconds.

Figure 15: Assessment of the available space between the restoration margin and the rubber dam.

Figure 18: Application of 3M[™] Scotchbond[™] Universal Adhesive onto the tooth surface after rinsing and drying. According to the manufacturer's instructions, the adhesive is rubbed into the tooth surface for 20 seconds and air-dried until it no longer shows any movement.

Figure 16: Products used for the adhesive cementation procedure. Use of the phosphoric etching gel is optional when a universal adhesive is used. However, studies have shown that selective enamel etching may lead to an enhanced bond strength.

Figure 19: Situation after pre-treatment of the maxillary right central incisor in the same way, application of 3M[™] RelyX[™] Ultimate Adhesive Resin Cement into the restorations, restoration placement, excess removal with a sponge pellet and covering of the margins with glycerin gel to avoid oxygen inhibition. The cement was finally light-cured for 20 seconds per surface.

Figure 20: Aesthetic treatment result one week after placement of the restorations.

Figure 21: Perfect optical integration of the indirect restorations is obtained.

Figure 22: Beauty shot stressing the natural appearance of the glass ceramic restorations.

Figure 23: Comparison of the situation at baseline ...

Figure 24: ... and six years after placement of the restorations: The patient is still happy with the functional and aesthetic result and clinically, there are no signs of marginal degradation or discolouration.

References:

- ¹ Fasbinder DJ, Neiva GF, Dennison JB, Heys D, Heys R: Clinical Evaluation of CAD/CAM resin nano ceramic and leucite-reinforced glass-ceramic onlays. AADR 2016, Los Angeles, Abstract No. 254.
- ² Vogl V, Hiller KA, Buchalla W, Federlin M, Schmalz G. Controlled, prospective, randomized, clinical split-mouth evaluation of partial ceramic crowns luted with a new, universal adhesive system/resin cement: results after 18 months. Clin Oral Investig. 2016 Dec;20(9):2481-2492.
- ³ 3M RelyX Ultimate Adhesive Resin Cement: 5-year clinical performance. THE DENAL ADVISOR, Volume 34, Number 2, March-April 2017.

Prof Paulo Monteiro

Professor Paulo Monteiro obtained his degree as a Doctor of Dental Medicine at the Instituto Superior de Ciências da Saúde in Caparica (ISCSEM), Portugal. Here, he started to develop a passion for aesthetic dentistry. In 2005, the author completed post-graduation programs in Esthetic and Restorative Dentistry at the ISCSEM. He also obtained a Master's degree in Dental Medicine at the same institute. He is a Coordinator and Professor of the Restorative post-graduation program, Aesthetic and Restorative Dentistry at Instituto Universitário Egas Moniz and has an exclusive dental practice in Lisbon that focuses on aesthetic and cosmetic dental treatments.

Contact:

Prof Paulo Monteiro DMD, MSc
paulojorgemonteiro@yahoo.ca

Australia 3M.com.au/dental **New Zealand** 3M.co.nz/dental

Scientific Affairs

Stephen Langdon Email: sdlangdon@3M.com

Janice Pitt Email: jpitt3@3M.com

3M Health Care Academy

3M Australia Pty Limited Building A, 1 Rivett Road North Ryde, NSW 2113 Ph: 1300 363 454 3M.com.au

3M New Zealand Limited 94 Apollo Drive Rosedale, Auckland 0632 Ph: 0800 80 81 82 3M.co.nz Published by 3M Oral Care. 3M, "3M Science. Applied to Life." and Espertise are trademarks of 3M. 3M Health Care Academy is a service mark of 3M. All other trademarks are owned by other companies. Please always follow the 3M Product Instructions For Use for best clinical results. © 3M 2019. All rights reserved.