

- **Micro-shear bond strength and morphological interface of self-etching adhesives to ground enamel. *Egypt. Dent. J.* July 2007.**

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Abstract:

Objectives: This study compared the enamel bonds of three types of adhesives using the microshear bond test, SEM and fractography.

Methods: Three self-etching adhesives; Futurabond DC (Voco), Clearfil S Tri Bond (Kuraray) and Hybrid bond (Sun-Medical), a self-etching primer Clearfil SE Bond (Kuraray) and an etch-and-rinse system Admira Bond (Voco) were selected. Thirty human molars were used. The root of each tooth was removed and the crown was sectioned into two halves. The convex enamel surfaces were reduced by polishing on silicone paper to prepare a flat surface. The bonding systems were applied on this surface. Prior to adhesive curing, a hollow cylinder (4.0 mm height/0.75 mm internal diameter) were placed on the treated surfaces and cured. A composite resin was then inserted into the tube and cured. After water storage for 24 hours, the tube was removed and Shear bond strength was carried out in a universal testing machine at a crosshead speed of 0.5/ min. The enamel of five additional teeth was ground and the etching component of each adhesive was applied and removed with absolute ethanol instead of being light cured. These teeth and the selected fractured surface were examined in SEM.

Results: Adhesion to ground enamel of the Futurabond DC (25 ± 3.5 MPa) and Clearfil SE Bond (23 ± 2.9 MPa) self-etching systems was not significantly different from Admira Bond (27 ± 2.3 Mpa). The two self-etching adhesive Clearfil S Tri bond and Hybrid Bond demonstrated significantly lower bond strengths (14 ± 1.4 Mpa; 11 ± 1.9 Mpa) with no significant differences among them ($p < 0.05$).

Conclusion: Bond strength to ground enamel of self-etching adhesive systems were dependant on the type of adhesive and some materials showed bond strength that was not different than that of etch-and-rinse systems. There was no correlation between bond strength and microscopic topographical changes.

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