

ABSTRACT

Comparison of shear bond strength of self-etch and self-adhesive cements bonded to lithium disilicate, enamel and dentin.

Aims. With several self-adhesive resin cements currently available, there is confusion about which product and technique is optimal for bonding ceramic restorations to teeth. The objective of this study was to compare the shear bond strength of lithium disilicate cemented to enamel and dentin using 5 adhesive cements.

Materials and Methods. 100 lithium disilicate rods were pretreated with 5% hydrofluoric acid, silane, and cemented to 50 enamel and 50 dentin surfaces using five test cements: Variolink II (etch-and-rinse) control group, Clearfil Esthetic (two step self-etch), RelyX Unicem, SpeedCEM, and BifixSE (self-adhesive). All specimens were stored (37°C, 100% humidity) for 24 hours before testing their shear bond strength using a universal testing machine (Instron). Debonded surfaces were observed under a low-power microscope to assess the location and type of failure.

Results. The highest bond strength for both enamel and dentin were recorded for Variolink II, 15.1MPa and 20.4MPa respectively, and the lowest were recorded for BifixSE, 0.6MPa and 0.9MPa respectively. Generally, higher bond strengths were found for dentin (7.4MPa) than enamel (5.3MPa). Tukey's post hoc test showed no significant difference between Clearfil Esthetic and SpeedCem ($p=0.059$), Unicem and SpeedCem ($p=0.88$), and Unicem and BifixSE ($p=0.092$). All cements bonded better to lithium disilicate than to enamel or dentin, as all bond failures occurred at the tooth/adhesive interface except for Variolink II.

Conclusions. Bond strengths recorded for self-adhesive cements were very low compared to the control "etch and rinse" and self-etch systems. Further improvements are apparently needed in self-adhesive cements for them to replace multistep adhesive systems.

Clinical Implications. The use of conventional etch and rinse cements such as Variolink II should be preferred for cementing all ceramic restorations over self-adhesive cements until the bond strengths are improved.

KEY WORDS

Shear bond strength, lithium disilicate, self-etch cement, self-adhesive cement, enamel and dentin.