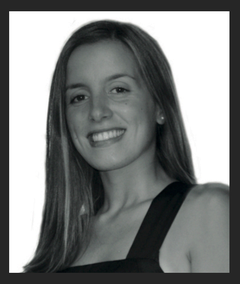

Dentin bond strength of a universal adhesive system

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Purpose

To compare the immediate microtensile bond strength of one universal adhesive system (Scotchbond Universal Adhesive, 3M ESPE, St Paul, MN) applied to dentin according to the etch-and-rinse and the self-etch technique.

Materials and Methods

Six recently extracted human third molars, intact and without macroscopic evidence of caries or restorations, were assigned to two groups according to the etching strategy: 1) SBU TE D – Scotchbond Universal Adhesive applied as a 2-step etch-and-rinse adhesive on moist dentin and 2) SBU SE D - Scotchbond Universal Adhesive applied as a 1-step self-etch adhesive on moist dentin, both per manufacturer's instructions. Resin composite build-ups (UD4 ENAMEL Plus HRi, Micerium S.p.A. Avegno, GE, Italy) were applied in three increments of 2 mm each, until a height of 6 mm: each layer was light cured for 20 seconds with an additional light polymerization performed on facial, lingual, mesial and distal surfaces for 10 seconds. The teeth were stored in distilled water in an incubator (24h/37°C). Specimens were sectioned to obtain sticks with 1mm^2 of cross sectional area, that were tested to failure in a universal testing machine at a crosshead speed of 1mm/minute, to assess dentin microtensile bond strength (μTBS). A paired-sample t-test was performed when the assumption of normality was valid (alfa=0,05).

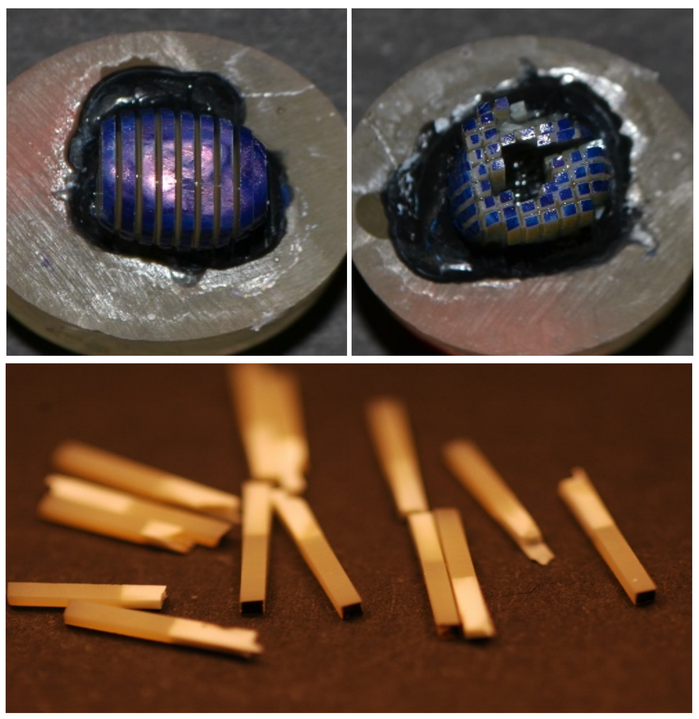
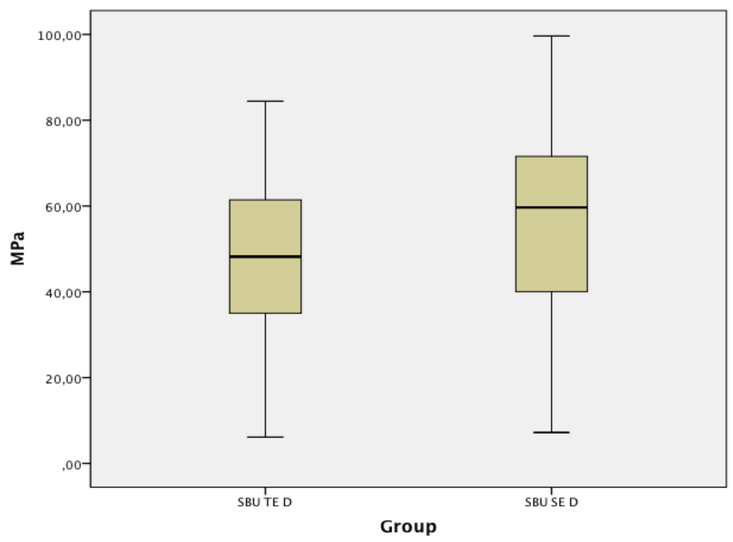


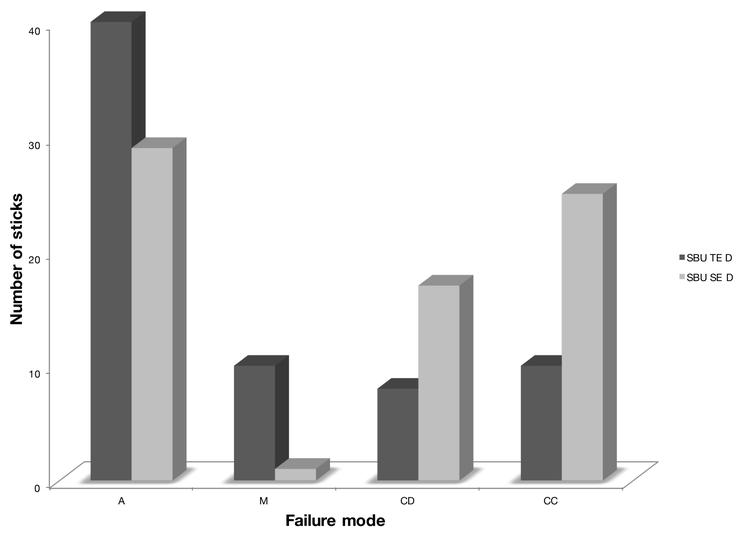
Figure 1 - Teeth after being sectioned to obtain sticks.

Results

The mean μTBS of the SBU SE D group (56,9 ± 2,5 MPa) was statistically higher than SBU TE D (48,0 ± 2,1 MPa) ($p < 0,05$).



Graphic 1 - Box-whisker plot of the μTBS for SBU TE D and SBU SE D (x axis represents the group and y axis the MPa).



Graphic 2 - Failure mode distribution: A- adhesive; M – mixed; CD - cohesive in dentin; CC – cohesive in composite.

Conclusions

It can be concluded that improved bonding effectiveness of Scotchbond Universal Adhesive to dentin seems to be obtained when the adhesive is applied with the self-etch approach.

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