



Dentin bond strength of a universal and a self-etch adhesive

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Research performed at UICOB (Biomedical and Oral Sciences Research Unit)

Purpose

To compare the immediate microtensile bond strength to dentin of a universal adhesive system (Scotchbond Universal Adhesive, 3M ESPE, St Paul, MN, USA) in self-etch technique, with a two-step self-etch adhesive (Clearfil SE Bond, Kuraray, Okayama, Japan).

Materials and Methods

Six caries-free human third molars were used to obtain crown segments by exposing middle dentin and then randomly distributed into two groups according to the different adhesive systems used: 1) Scotchbond Universal applied as one-step self-etch adhesive (SBU SE D) and 2) Clearfil SE applied as two-step self-etch adhesive (CL SE D), both per manufacturer's instructions. Resin composite build-ups (UD4, ENAMEL plus HRI, Micerium S.p.A. Avegno, GE, Italy) were applied in increments of 2 mm each, until a height of 6mm: each layer was light cured for 20 seconds with an additional light polymerization performed on mesial, distal, facial and lingual surfaces for 10 seconds. The teeth were then stored in distilled water in an incubator (24h/37°C). Specimens were sectioned to obtain sticks with 1mm² of cross sectional area, that were tested to failure in a universal testing machine at a crosshead speed of 1mm/min to assess dentin microtensile bond strength (μ TBS). Data were analyzed with a parametric paired-sample t test when the assumption of normality was valid ($\alpha= 0,05$).

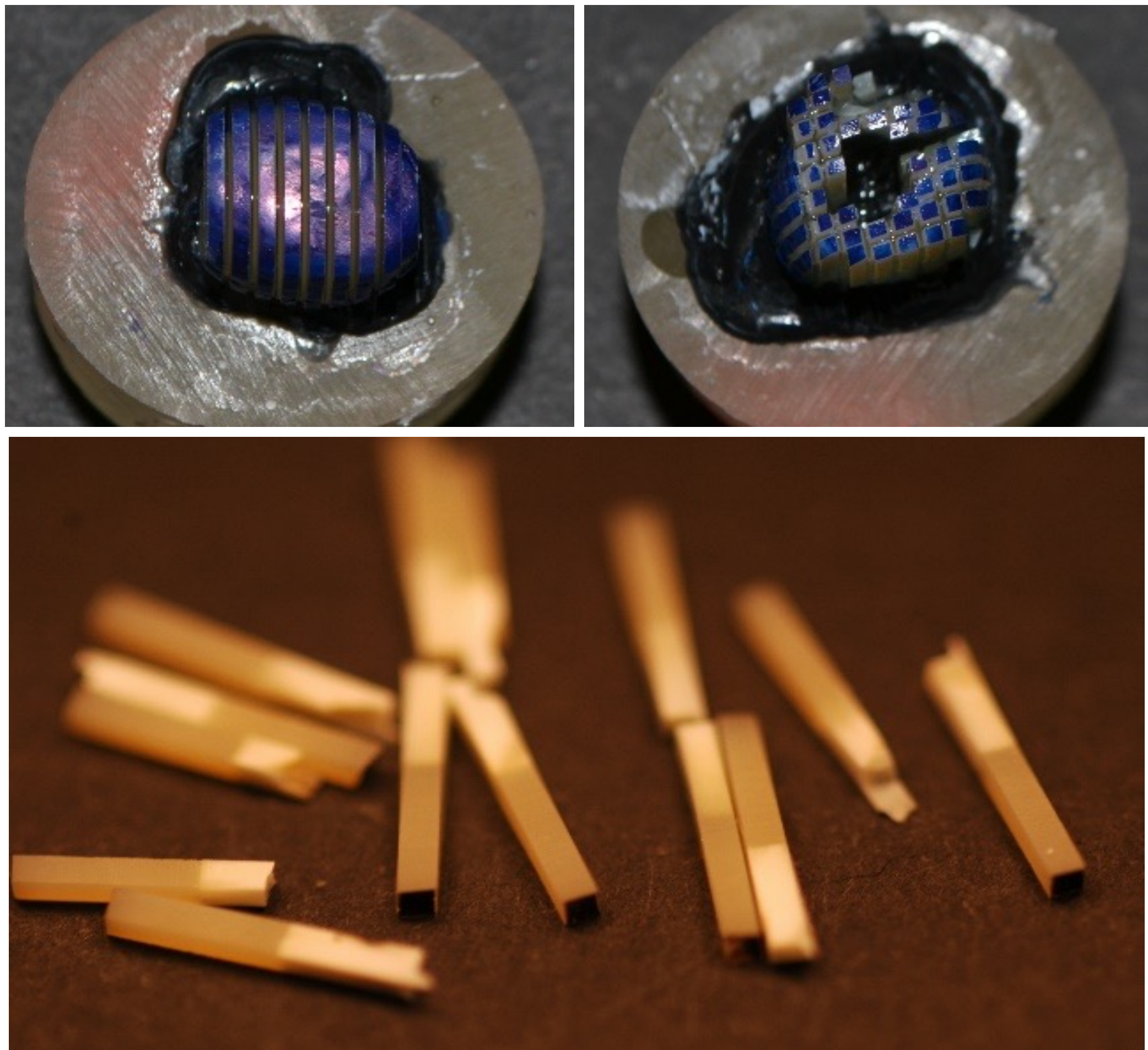
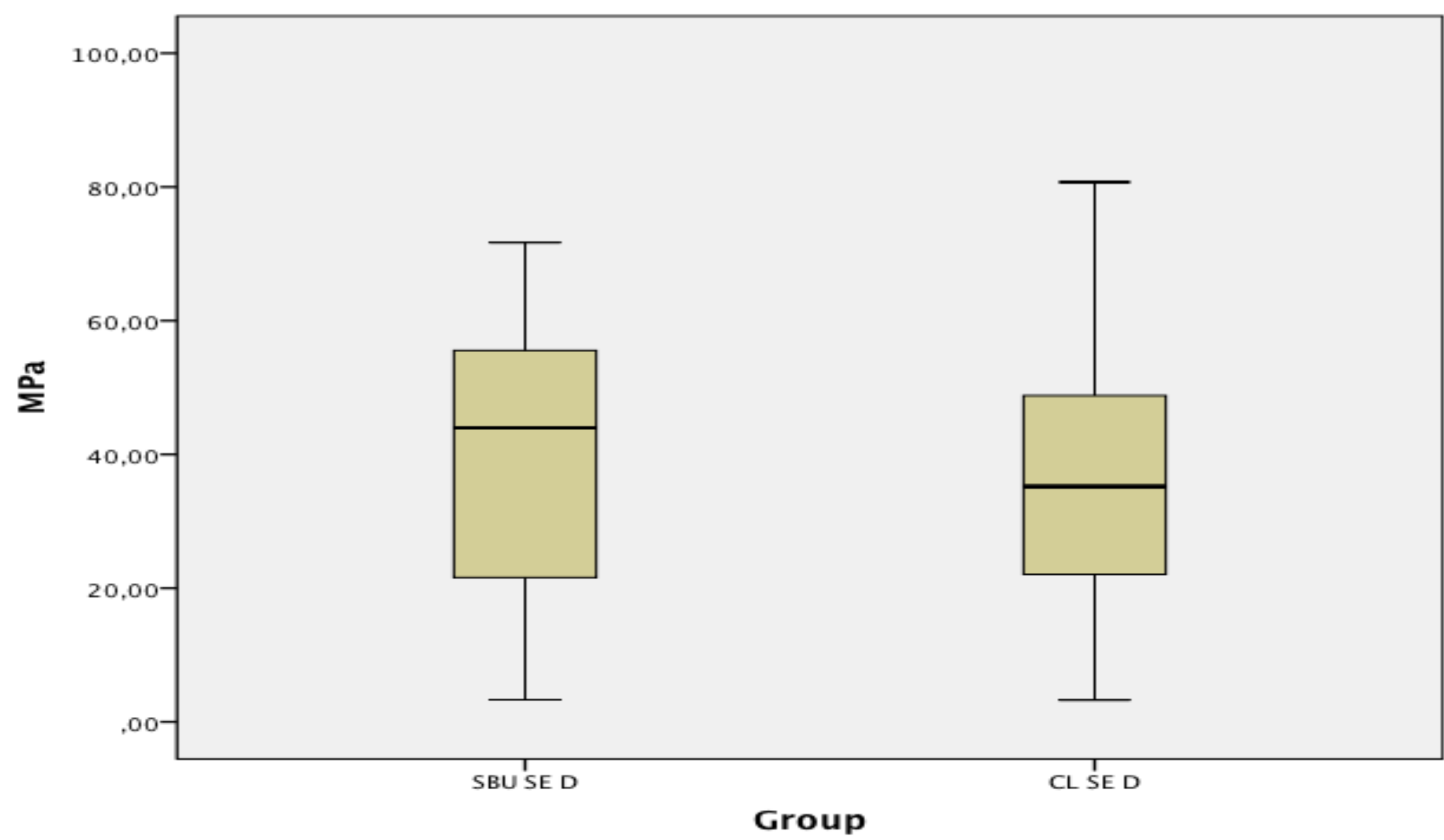


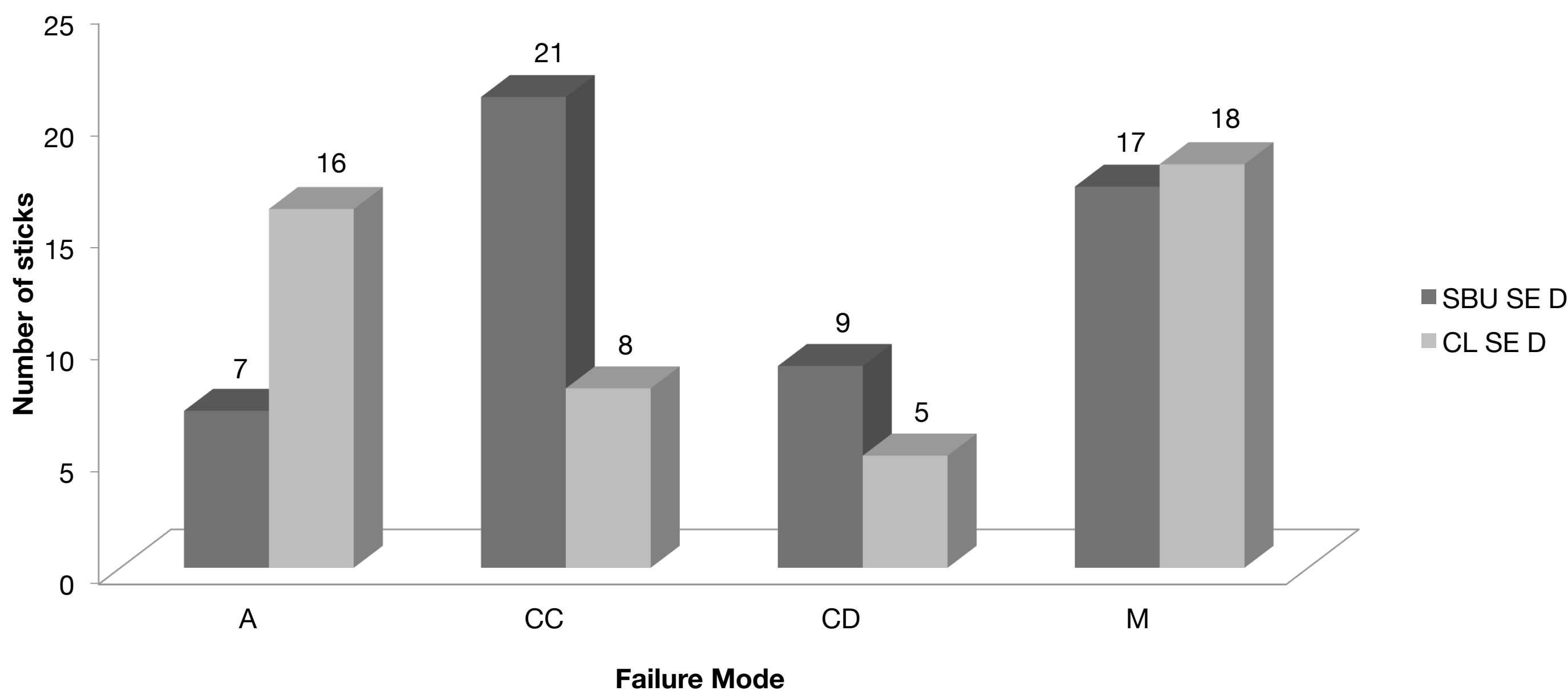
Figure 1- Teeth after being sectioned to obtain sticks.

Results

SBU SE D showed higher μ TBS mean (41.03 \pm 19.31 MPa) than CL SE D (36.70 \pm 17.77 MPa), nevertheless the comparison between these two adhesive systems revealed no significant statistical differences ($p > 0,05$).



Graphic 1 - Box-whisker plot of the μ TBS for SBU SE D and CL SE D: x axis represents the group and y axis the MPa.



Graphic 2 - Failure mode distribution: A- adhesive failure; CC- Composite cohesive failure; CD- dentine cohesive failure; M – mixed failure.

Conclusions

The universal adhesive tested in this study, when used in self-etch mode, seems to have an immediate performance on dentin similar to the more conventional two-step self-etch adhesive Clearfil SE Bond.

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