Comparison of shear bond strength of orthodontic brackets bonded with a universal adhesive using different etching methods

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DOI: *https://doi.org/10.1590/2177-6709.24.4.33.e1-8.onl*

Objective: The aim of this study was to compare the effects of three enamel etching modes — laser-etch, self-etch and acid-etch (5, 10 and 15 s) — on bracket bonding, using a universal adhesive.

Methods: Eighty-four maxillary premolars were randomly divided into seven groups (n=12) based on the etching method and the adhesive used for bracket bonding. After water storage and thermocycling, shear bond strength was measured, and adhesive remnant index scores on debonded enamel were determined.

Results: There were significant differences between the seven groups regarding bond strength values ($p<0.001$). The highest values were observed in universal adhesive with laser etching group, while Transbond XT with acid or laser etching, and universal adhesive used in self-etch mode demonstrated the lowest bond strength. The universal adhesive with the three different etching times presented with statistically similar results, all showing an improvement in bond strength, compared with Scotchbond universal (SBU)/SE.

Conclusions: The universal adhesive evaluated in the present study demonstrated statistically similar bond strengths to conventional orthodontic adhesive in self-etch mode. The bond strength can be improved by adding an initial acid etching or laser conditioning step, although enamel damage was observed in some cases.

Keywords: Orthodontic adhesive. Orthodontic brackets. Laser.

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How to cite: Shafiei F, Sardarian A, Fekrazad R, Farjood A. Comparison of shear bond strength of orthodontic brackets bonded with a universal adhesive using different etching methods. Dental Press J Orthod. 2019 July-Aug;24(4):33.e1-8. DOI: https://doi.org/10.1590/2177-6709.24.4.33.e1-8.onl

Submitted: January 04, 2018 - **Revised and accepted:** December 29, 2018

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