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Comparative bonding ability to dentin of a universal adhesive system and monomer conversion as functions of extended light curing times and storage

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ABSTRACT

Objectives.

The purpose of this *in vitro* study was to evaluate the bonding ability and monomer conversion of a universal adhesive system applied to dentin as functions of different curing times and storage. The results were compared among a variety of commercial adhesives.

Materials and Methods.

Flat superficial dentin surfaces were exposed on human molars and assigned into one of the following adhesives (n=15): total-etch *Adper Single Bond 2* (SB) and *Optibond Solo Plus* (OS), self-etch *Optibond All in One* (OA) and *Clearfil SE Bond* (CSE), and *Scotchbond Universal Adhesive* in self-etch mode (SU). The adhesives were applied following the manufacturers' instructions and cured for 10, 20, or 40 s. Specimens were processed for the microtensile bond strength (μ TBS) test in accordance with the non-trimming technique and tested after 24 h and 2 years. The fractured specimens were classified under scanning electron microscopy (SEM). Infrared (IR) spectra were obtained and monomer conversion (%) was calculated by comparing the aliphatic-to-aromatic IR absorption peak ratio before and after polymerization (n=5). Data were analyzed by 2-way ANOVA/Tukey's tests ($\alpha=0.05$).

Results.

At 24-h evaluation, *OA* and *CSE* presented similar bond strength means irrespective of the curing time, whereas *SB* and *SU* exhibited significantly higher means when cured for 40 s as did *OS* when cured for 20 or 40 s ($p<0.05$). At 2-year evaluation, only *OA* exhibited

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