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Deadline for submission: January 5, 2001

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<input type="checkbox"/> Print Problem <input type="checkbox"/> INVITER <input type="checkbox"/> Fellowship <input type="checkbox"/> IADR Hallam <input type="checkbox"/> Special Scheduling <input type="checkbox"/> Symposium/IRPW <input type="checkbox"/> For Office Use Only	<p>Compromised bonding of all-in-one adhesives upon delayed activation of light-cured composites. N.M.KING^{1*}, F.R.TAY¹, B.L.SUH², D.H.PASHLEY³ (¹The University of Hong Kong, CHINA; ²Bisco, Inc., IL, USA; ³Medical College of Georgia, USA)</p> <p>This study examined the effect of delayed activation of light-cured composites on the ultrastructure and microtensile bond strengths of three all-in-one adhesives to sound dentin. Flat dentin surfaces prepared from human third molars were bonded with either Prompt L-Pop (PL; ESPE), One-Up Bond F (OU; Tokuyama) or Reactmer Bond (RB; Shofu). Each adhesive was divided into 5 subgroups each containing three teeth. A hybrid composite (Spectrum^{TPH}, Dentsply DeTrey) was left in contact with the cured adhesive surfaces for 0, 2.5, 5, 10 or 20 min before light-activation. Composite-dentin beams, with average cross-sectional areas of 0.8 mm² were prepared for bond testing. Fractured beams were prepared for SEM examination. Additional specimens were prepared in the 0 and 20 min-delay subgroups for TEM examination. Results: Kruskal-Wallis ANOVA and Dunn's tests indicated significant differences among the subgroups of each adhesive. Regression analyses showed that for each adhesive, there was an exponential decline in mean bond strength with increasing time-delay in light-activation. The correlation was highly significant ($r = -0.99$ for PL; -0.96 for OU and -0.99 for RB). SEM examination revealed large voids on the adhesive-composite interfaces in PL-10 and PL-20, that were not present in the immediate light-activated subgroup. OB-20 and RB-20 subgroups also exhibited adhesive failure modes, with characteristic honeycomb appearances on the fractured composite-adhesive interfaces. TEM examination of the 20 min-delay subgroups revealed soapsud-like blisters that were absent in the immediate light-cured subgroups. <u>It is concluded that adverse interactions between acidic resin monomers from the air inhibition layers of the cured adhesives, and some components of light-cured composites can occur on prolonged contact.</u> (Supported by grant DE06427 from NIDCR)</p>	<p>1477</p> <p>897</p>
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