

1683 Effects of Agitation of Self-etching Primers/Adhesives on Resin-Dentin Bond Strength

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This study compared the microtensile bond strength (μ TBS) and the ultrastructure of resin-dentin interfaces of four self-etching systems that were applied to dentin with thick smear layers. Human third molars were ground with 180-grit SiC papers to expose deep coronal dentin. A 3-mm vertical slit was made along the diameter of each tooth to fit a glass cover slip, dividing each tooth into two bonding surfaces. Two two-step, self-etching primers (ABF experimental system, Kuraray and Imperva Fluoro Bond, Shofu) and two single-step, self-etching adhesives (One-Up Bond F, Tokuyama and AQ Bond, Sun Medical) were examined. Adhesives were applied to one side of the teeth passively, and to other side with continuous agitation for the same self-etching period. Incremental composite buildups were performed and beams with cross-sectional areas of 0.81mm² were prepared for μ TBS evaluation. Demineralized, bonded specimens were processed for TEM examination. Two-way ANOVA showed that both the adhesive type and the application mode significantly affected μ TBS results. However, the interaction of these two factors was not statistically significant ($P>0.05$). For each adhesive, agitation produced significantly higher μ TBS than passive application. With passive application, all systems diffused through thick smear layers and formed thin hybrid layers in intact dentin. With continuous agitation, smear layers were completely dispersed or dissolved, and thicker hybrid layers with upstanding collagen fibrils were observed. It is concluded that bonding of mild self-etching primers/adhesives to dentin with clinically relevant, thick smear layers may be improved by continuous agitation during the self-etching process. (Supported by Faculty of Dentistry, HKU and grant DE 06427 from NIDCR)

[Seq #159 - Bond Strength to Enamel and Dentin](#)

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