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Effect of Self-etch Silane Contamination on Dentin Bond Strength to Resin Composite

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Abstract

Objectives: This study aimed to investigate the effect of self-etch silane contamination on dentin bond strength to resin composite when using different adhesive systems.

Methods: 40 flat occlusal dentin surfaces were prepared and randomly divided into 4 groups (n=10): group ER (Optibond FL); group SE (Clearfil SE bond); group SiER and group SiSE (Monobond Etch and Prime (MEP) followed by Optibond FL and Clearfil SE bond, respectively). Microtensile bond strength (μ TBS) data was analyzed by two-way and one-way ANOVA followed by the post hoc Tukey honest test. The failure mode data was analyzed using Pearson Chi-square test. After undergoing different contamination procedures (distill water, phosphoric acid, and acidic primer with and without MEP contamination), 6 additional specimens were analyzed by scanning electron microscopy (SEM).

Results: The two-way ANOVA indicated that the adhesive system and silane contamination significantly influenced the μ TBS. μ TBS (MPa) of all (ER 47.79 \pm 3.48; SiER 41.16 \pm 11; SE 39.77 \pm 3.16; SiSE 35.10 \pm 4.12) groups were significantly different from each other, except for the SE versus SiER group. The silane contamination significantly decreased the μ TBS for both adhesive systems. Adhesive failure was the most common failure mode for the SiER, SE, and SiSE groups.

Conclusions: Self-etch silane cross-contamination on dentin negatively impacted the μ TBS of etch-and-rinse and self-etch adhesive systems. However, the etch-and-rinse adhesive system may be more effective in mitigating the effects of dentin contamination than the self-etch adhesive system.

Keywords: ammonium polyfluoride, bond strength, contamination, dentin, self-etch silane