

عنوان مقاله:

In Vitro Evaluation of the Effect of Different Surface Treatments of a Hybrid Ceramic on the Microtensile Bond Strength to a Luting Resin Cement

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Abstract Introduction: The aim of this present study was to investigate the effect of different surface treatments of a hybrid ceramic, Vita Enamic (VE), on the micro-tensile bond strength (μ -TBS) to a resin cement. **Materials and methods:** 10 blocks (3×1.0×8 mm) were retrieved from the original blocks and divided into five groups according to the different surface treatment performed: Groups 1: 35% Acid phosphoric for 60 seconds (PA); group 2: Sandblasting with 50 μ m Al₂O₃ particles for 10 seconds (SB); groups 3: 9.5% hydrofluoric acid for 60 seconds (HF), group 4: Er:YAG laser (2 W, 10 Hz) (ER1), group 5: Er:YAG laser (3 W, 10 Hz) (ER2). All treated surfaces were salinized and the blocks with similar surface treatments were bonded together using a dual cured resin cement and light cured. After 24-hour storage in water, blocks were cut into beams (1mm²). Half of the specimens in each group (n=16) were tested immediately and the rest were subjected to thermocycling between 5°C and 55°C for 6000 cycles before μ -TBS test at a crosshead speed of 0.5 mm/min. The data were analyzed using two-way ANOVA and Tukey HSD tests considering 0.05 as significance level. The failure mode was evaluated using a stereomicroscope. **Result:** μ -TBS was clearly influenced by surface treatment methods (P<0.001) and thermocycling significantly decreased the bond strength values in all groups (P=0.007). The highest value (66.07 MPa±11.3) was obtained for HF groups with no thermocycling and the lowest values were observed in laser groups with no significant difference among different irradiation parameters. Adhesive failure was mainly observed in PA and SB groups while mixed failure was predominantly shown in laser and HF groups. **Conclusion:** This study demonstrates that surface treatment of VE with HF and salinization can improve the bond strength to a dual cured resin cement and Er:YAG laser irradiation with the evaluated parameters did not promote adhesion of the resin cement to VE. **Keywords:** Er YAG laser Hybrid Ceramic Tensile strength Surface treatment

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