

Original Article

Repair Bond Strength of Composite Resin to Dental Ceramic Using Various Surface Treatments: An *In Vitro* Study

Abstract

Aim: This research aims to evaluate and compare the effect of various surface treatments and adhesive types on the bond strength between composite resin and two types of ceramic materials. **Materials and Methods:** A total of 98 disk-shaped of 10 mm diameter and 4 mm thickness were fabricated for each of the zirconia (H. C. Starck) and lithium disilicate (IPS E-Max computer-aided design), which were implanted individually in the acrylic resin mold leaving one surface exposed. The disks in each group were sub-divided according to the surface treatments into seven groups ($n = 14$): [hydrofluoric acid (HF, 9.5%), air abrasion, bur, laser, HF + bur, HF + air abrasion, HF + laser]. Each sub-group was further divided into two groups ($n = 7$) according to the type of adhesive used for the repairing procedure [G-Premio Bond universal adhesive group and intraoral repair kit (BISCO) group]. Each adhesive was applied depending on manufacturer instructions and, then, the composite cylinder (4 mm in diameter and 4 mm in height) was built on the pre-determined treated ceramic surface area by the addition of rubber mold. Then the samples were stored in distal water for 24 h. After that, all groups were submitted to a shear bond test using an Instron testing machine (TSTM 02500; Elista Ltd., Istanbul, Turkey) at 0.5 mm/min a crosshead speed. The data were analyzed by three-way analysis of variance and Tukey *post hoc* test at ($P \leq 0.05$). **Results:** The HF + air abrasion groups registered the higher bond strength but with no statistically significant difference from groups of HF + bur. While the laser groups showed the lowest mean bond strength. Generally, E-Max registered significantly higher bond strength in comparison to zirconia. Finally, the BISCO repair system registered a significantly higher bond strength value in comparison to G-Premio. **Conclusion:** Combined surface treatment of HF + air abrasion with an intraoral repair kit can provide a promising method for repairing cracked ceramic restorations. However, repairing lithium disilicate is more predictable and successful than zirconia