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Original Article

Efficacy of ceramic repair material on the bond strength of composite resin to zirconia ceramic

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Abstract

Objective. The aim of this study was to evaluate the shear bond strength of composite resin in five different repair systems. Materials and methods. Sixty specimens (7 mm in diameter and 3 mm in height) of zirconia ceramic were fabricated. All specimen surfaces were prepared with a 30 µm fine diamond rotary cutting instrument with water irrigation for 10 s and dried with oil-free air. Specimens were then randomly divided into six groups for the following different intra-oral repair systems (n = 10): Group 1, control group; Group 2, Cojet system (3M ESPE, Seefeld, Germany); Group 3, Cimara® System (Voco, Cuxhaven, Germany); Group 4, Z-Prime Plus System (Bisco Inc., Schaumburg, IL); Group 5, Clearfil™ System (Kuraray, Osaka, Japan); and Group 6, Z-Bond System (Danville, CA). After surface conditioning, a composite resin Grandio (Voco, Cuxhaven, Germany) was applied to the zirconia surface using a cylindrical mold (5 mm in

diameter and 3 mm in length) and incrementally filled up, according to the manufacturer’s instructions of each intra-oral system. Each specimen was subjected to a shear load at a crosshead speed of 1 mm/min until fracture. One-way analysis of variance (ANOVA) and Tukey post-hoc tests were used to analyze the bond strength values. Results. There were significant differences between Groups 2–6 and Group 1. The highest bond strength values were obtained with Group 2 (17.26 ± 3.22) and Group 3 (17.31 ± 3.62), while the lowest values were observed with Group 1 (8.96 ± 1.62) and Group 6 (12.85 ± 3.95). Conclusion. All repair systems tested increased the bond strength values between zirconia and composite resin that used surface grinding with a diamond bur.

Key Words:

zirconia repair composite resin sear bond strength Y-TZP

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