

Acta Odontologica Scandinavica >

Volume 73, 2015 - [Issue 1](#)

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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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Pages 28-32 | Received 09 Mar 2014, Accepted 08 Jul 2014, Published online: 06 Nov 2014

🗨️ Cite this article 🔗 <https://doi.org/10.3109/00016357.2014.946963>



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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 shear bond strength Y-TZP

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