



Surface Treatment Effect on Shear Bond Strength between Lithium Disilicate Glass-Ceramic and Resin Cement

Siripan Simasetha¹ Awiruth Klaisiri² Tool Sriamporn³ Kraisorn Sappayatosok⁴
Niyom Thamrongananskul¹

¹ Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand

² Division of Operative Dentistry, Faculty of Dentistry, Thammasat University, Pathumthani, Thailand

³ Department of Prosthodontics, College of Dental Medicine, Rangsit University, Pathumthani, Thailand

⁴ Department of Oral Diagnostic Science, College of Dental Medicine, Rangsit University, Pathumthani, Thailand

Address for correspondence Niyom Thamrongananskul, DDS, MSc, PhD, Department of Prosthodontics, Faculty of Dentistry, Chulalongkorn University, Pathumwan, Bangkok 10330, Thailand (e-mail: niyom.t@chula.ac.th).

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Abstract

Objective The study aimed to evaluate the shear bond strength (SBS) of lithium disilicate glass-ceramic (LDGC) and resin cement (RC) using different surface treatments.

Materials and Methods LDGC blocks (Vintage LD Press) were prepared, etched with 4.5% hydrofluoric acid, and randomly divided into seven groups ($n = 10$), depending on the surface treatments. The groups were divided as follows: 1) no surface treatment (control), 2) Silane Primer (KS), 3) Signum Ceramic Bond I (SGI), 4) Signum Ceramic Bond I/Signum Ceramic Bond II (SGI/SGII), 5) experimental silane (EXP), 6) experimental silane/Signum Ceramic Bond II (EXP/SGII), and 7) Experimental/Adper Scotchbond Multi-purpose Adhesive (EXP/ADP). The specimens were cemented to resin composite blocks with resin cement and stored in water at 37 °C for 24 hours. The specimens underwent 5,000 thermal cycles and were subjected to the SBS test. Mode of failure was evaluated under the stereo microscope.

Statistical Analysis Data were analyzed with Welch ANOVA and Games-Howell post hoc tests ($\alpha = 0.05$).

Results The highest mean SBS showed in group EXP/ADP (45.49 ± 3.37 MPa); however, this was not significantly different from group EXP/SGII (41.38 ± 2.17 MPa) ($p \geq 0.05$). The lowest SBS was shown in the control group (18.36 ± 0.69 MPa). This was not significantly different from group KS (20.17 ± 1.10 MPa) ($p \geq 0.05$).

Conclusions The different surface treatments significantly affected the SBS value between LDGC and RC. The application of pure silane coupling agent with or without the application of an adhesive improved the SBS value and bond quality.

Keywords

- ▶ lithium disilicate
- ▶ resin cement
- ▶ silane
- ▶ shear bond strength

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