Bond strength of all-ceramics to tooth structure: using new luting systems.


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Abstract

PURPOSE: To examine the effect of different adhesive luting systems on the shear bond strength of all-ceramic restorations to dentin surfaces.

MATERIALS AND METHODS: Forty-eight all-ceramic disks (2 x 3 mm; IPS e.max Press) were fabricated. Forty-eight noncarious extracted human molars were divided into 4 groups. in groups 1 to 4, IPS e.max Press disks were luted with Variolink 2/Excite DSC (etch-and-rinse), Clearfil Esthetic Cement/Clearfil Protect Bond (antibacterial and self-etching), Multilink/Multilink Primer (self-etching), or Multilink Sprint (self-adhesive). All specimens were subjected to 5000 thermocycles (5 degrees C to 55 degrees C, 30-s dwell time). Shear bond strengths were tested using a universal testing machine until failure. The analysis of the fractured dentin surfaces was performed using an optical microscope at 10X and 1000X magnification; the images were analyzed with an image analyzer. Data were analyzed with one-way ANOVA and Tukey’s test at a significance level of p < 0.05.

RESULTS: Mean shear bond strength data of the groups in MPa were: Variolink 2/Excite DSC: 25.89 +/- 3.71; Clearfil Esthetic Cement/Clearfil Protect Bond: 17.21 +/- 2.71; Multilink/Multilink Primer: 11.6 +/- 3.51; Multilink Sprint: 10.4 +/- 3.15. According to the one-way ANOVA, there were significant differences in shear bond strength (p < 0.001). According to Tukey’s test, statistically significant differences were observed in shear bond strength between groups 1 and 2 (p < 0.001), groups 1 and 3 (p < 0.001), groups 1 and 4 (p < 0.001), groups 2 and 3 (p = 0.003), and groups 2 and 4 (p < 0.001). Conclusion: The etch-and-rinse dentin bonding system produced higher bond strengths of all-ceramics to
dentin surfaces than did the self-etching bonding systems and self-adhesive luting system.

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