Microshear Bond Strength of Tri-Calcium Silicate-based Cements to Different Restorative Materials.

Abstract

PURPOSE: To evaluate the microshear bond strength of tri-calcium silicate-based materials to different restorative materials.

MATERIALS AND METHODS: Thirty-five disks of TheraCal LC and Biodentine were fabricated using teflon molds according to manufacturers’ instructions. Then the specimens were randomly divided into 7 groups according to the materials applied: Fuji IX, Fuji II, Equia Fil, Vertise Flow, Filtek Bulk Fill Posterior Restorative, Filtek Z250 with Prime&Bond NT and with Clearfil SE Bond. All restorative materials were placed onto the disks using tygon tubes. Following a storage period, the specimens underwent microshear bond strength testing in a universal testing machine, and fracture modes were analyzed. Data were analyzed using one-way ANOVA and Tukey’s post-hoc test.

RESULTS: For all restorative materials, TheraCal LC showed significantly higher μSBS values compared to Biodentine. GIC based materials showed the lowest μSBS for TheraCal and Biodentine. For Biodentine, Filtek Z250 applied with Prime&Bond NT and Filtek Bulk Fill Posterior Restorative applied with Scotchbond Universal Adhesive exhibited the highest μSBS, while Filtek Z250 applied with Clearfil SE Bond revealed the highest bond strength to TheraCal LC.

CONCLUSION: For all restorative materials tested in this study, TheraCal LC showed higher μSBS compared to Biodentine. For both TheraCal LC and Biodentine, the placement of GIC-based materials prior to composite resin restorations might decrease the bond strength. Composite resins applied with self-etching adhesives increased the bond strength of TheraCal LC; however, for Biodentine, application of etch-and-rinse adhesives may improve the adhesion of
composite resins.

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