Effect of Three Endodontic Materials on the Bond Strength of Two Composite Core Materials to Dentin

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Purpose: This study investigated the effect of dentin treatment with iodine potassium iodide, calcium hydroxide or a biphenol-A- diglycidylether epoxy resin sealer on the dentin bond strength of titanium-reinforced Bis-GMA and urethane dimethacrylate composite materials.

Materials and Methods: Dentin was exposed in four groups of extracted teeth (20 specimens each). Three groups were treated with one of the contaminants and the fourth group was left uncovered and served as the control group. All specimens were stored for 1 week at 37°C and 100% humidity. The dentin surfaces were cleaned with pumice slurry using a prophylaxis rubber cup, rinsed and dried. Then the dentin surfaces were treated using the conditioner and the primer of the GLUMA adhesive system followed by placement of composite core materials. After 20 minutes, debonding of the core materials was accomplished using a shear-peel test. A two-way analysis of variance and Tukey's multiple range test was performed based upon core type and contaminant type ($\alpha = 0.05$).

Results: Titanium-reinforced Bis-GMA composite showed significantly greater bond strength values than the urethane dimethacrylate composite material ($p < 0.0001$). The mean bond strength values in megapascals for the Bis-GMA resin ranged from 8.47 ±1.52 for the calcium hydroxide group to 9.81 ±0.94 for the control group. Mean bond strengths for the urethane dimethacrylate resin ranged from 3.35 ±0.90 for calcium hydroxide to 3.99 ±0.88 for iodine potassium iodide groups. Within each core group, no difference in bond strengths were noted compared to the uncontaminated control.

Conclusion: Pretreatment of the dentin with iodine potassium iodide, calcium hydroxide, or epoxy resin followed by pumicing and using the GLUMA system conditioner and primer had no effect on the bond strength of the two resin composite core materials. However, the titanium reinforced Bis-GMA composite exhibited significantly greater bond strength to dentin than the urethane dimethacrylate based composite.

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INDEX WORDS: bonding agents, intracanal medicaments, iodine potassium iodide, calcium hydroxide, epoxy resin, sealer cements