

MICROLEAKAGE OF FLUORINATED EXPERIMENTAL DENTIN BONDING AGENTS FOR COMPOSITE RESIN RESTORATIONS

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ABSTRACT

Statement of problem. The durability of a restoration is largely based on maintenance of the tooth/restoration interface which may lead to marginal integrity breakdown, microleakage, and staining and secondary caries.

Purpose. The purpose of this study was to determine if fluorinated dental bonding resins will reduce composite resin marginal microleakage

Materials and Methods, Light-cure filled and unfilled bonding resins were prepared from a basis resin of 45 bis-EMA, 40 TEGDMA, and 15% HEMA. Fluorinated TEGDMA, 0-30 wt was substituted for some TEGDMA. Class V restorations were made in 50 extracted human molar teeth, 3 mm length X 2 mm width X 1.5 mm depth centered on the cemento-enamel junction using 8 experimental formulations and 2 commercial bonding resins (n = 5) following a standard clinical protocol. The teeth were thermocycled 1500 times between 5 °C and 55 °C with 1-minute dwell times. Teeth were removed, dried, varnished, and placed in 50 silver nitrate solution at 37 °C for 24 hours in total darkness. The teeth were rinsed and sectioned through the restorations with a diamond saw yielding halves. For each half, dye penetration was assessed under 80-power stereoscopic microscope and measured in mm from margin to axial wall for occlusal and cervical margins.

Result. The data was analyzed statistically ($p < 0.05$) using ANOVA. At the occlusal margins, commercial and non fluorinated bonding resins leaked significantly less ($p < 0.05$) than the fluorinated composite resins. At the cervical margins, commercial bonding resins leaked significantly less ($p < 0.05$) than experimental bonding resins. Conclusion. Fluorinated TEGDMA did not reduce microleakage of composite resins.

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