

Microleakage under Flowable Liners (6/04)

Attar N, Turgut MD, Gungor HC. The effect of flowable resin composites as gingival increments on the microleakage of posterior resin composites. *Oper Dent* 2004;29:162-167.

Composite resin materials shrink upon curing and generate stresses that may threaten marginal integrity and lead to marginal gap formation and microleakage. Microleakage may contribute to marginal staining, post-operative sensitivity, secondary caries, and pulpal pathology. The higher viscosity packable composite resins may not adapt as well to cavity preparations and suggestions have been made to initially place a flowable composite resin liner. The purpose of this study was to determine the effect of flowable materials on gingival microleakage of microhybrid and packable composite resin restorations. Ninety Class 2 preparations were created in 45 extracted premolar teeth with cervical margins 1 mm below the cemento-enamel junction. The teeth were divided into three groups of fifteen teeth each. In each group, one side was restored incrementally with Surefil (Dentsply Caulk), Filtek P60 (3M ESPE), or Tetric Ceram (Ivoclar Vivadent) composite resin restoratives. On the other side, flowable materials, Dyract Flow (Dentsply Caulk), Filtek Flow (3M EPSE), or Tetric Flow (Ivoclar Vivadent) were placed first in a 1-mm increment before the respective composite resin was placed. After thermocycling and immersion in basic fuchsin, the teeth were sectioned and dye penetration was evaluated. **The authors found a statistically significant reduction in microleakage along the gingival walls in preparations lined with the flowable composite resins.**



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DIS Comment: This study demonstrated a reduction in microleakage at the floor of the proximal box when a flowable composite was placed prior to placement of a packable or microhybrid composite resin. However, other similar microleakage studies have been equivocal, with some authors showing a benefit of a flowable liner¹⁻² and other showing no benefit.³⁻⁵ The flowable composite resins, with less filler content, have greater flexibility, however, this benefit may be offset by the increase in polymerization shrinkage.⁶ A study by Hagge and others⁷ found extensive microleakage under composites with and without flowable liners. The only group not to suffer heavy leakage utilized a resin-modified glass ionomer restorative material in an open sandwich technique. The enhanced performance of resin-modified glass ionomers as liners on dentinal gingival margins has been substantiated in several laboratory and clinical studies.⁸⁻¹¹ Also, no significant difference in microleakage was observed between the packable and the microhybrid composite resins used in this study. More research is necessary to investigate the possible benefits of lining the gingival floor of the proximal box of composite resin restorations with flowable liners.

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