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The effect of flowable and dual-cure resin composite liners on gingival microleakage of posterior resin composites

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Abstract:

Background and Aim: Microleakage has been always a major concern in restorative dentistry. The curing contraction of composites still presents a problem with controlling microleakage and postoperative sensitivity. The aim of this study was to investigate the effect of flowable and dual-cure resin composite liners on gingival microleakage of packable resin composite restorations.

Materials and Methods: Sixty Class II cavities with cervical margins 1 mm below the CEJ were prepared in 30 extracted human molars. The teeth were randomly divided into five groups of 12 each. In control group, each tooth was restored incrementally with Tetric Ceram composite without applying any liner. In the second and forth groups, flowable materials- Tetric Flow and dual-cure composite resin cement Relay X ARC were placed respectively as a 1-mm thick gingival increment and cured before the resin composite restoration, whereas, in the third and fifth groups liners were cured with the first increment of packable composite.The restored teeth were stored for one week in distilled water at 37^0C, and thermocycled between 5^0C and 55^0C, sealed with nail varnish except the tooth - composite interface in cervical restoration margins and immersed in 2% basic fuchsin for 24 hours. Dye penetration was evaluated using a stereomicroscope with 28x magnification. The data were analyzed by Kruskal-Wallis and Mann-Whitney U-tests with $p<0.05$ as the level of significance.

Results: The results of this study indicated that there were significant statistical differences between control - cured flowable liner, control-flowable liner without separately curing, control-cured dual cure composite resin cement groups.However there were no significant differences between dual-cure composite resin cement without separately curing-control,cured flowable liner-cured dual cure composite resin cement, flowable liner without separately curing-dual cure composite resin cement without separately curing groups.

Conclusion: The results of this study indicated that none of techniques could thoroughly eliminate microleakage in gingival floor, however the effect of flowable or a dual-cure liner on reducing the gingival microleakage was found to be statistically significant in tested restorative material.

Keywords:

Microleakage ، Posterior Composite Restoration ، Flowable ، Dual-cure ، liner

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