

ABSTRACT |

Background

Polymerization shrinkage is the major drawback of resin based composites. Because of polymerization shrinkage, undesirable space or gaps are frequently detected in the proximal gingival margins of class II restorations. The filler content and the resin matrix composition of composite resin dictate the amount of volumetric shrinkage. So this *in-vitro study* was undertaken to evaluate the microleakage and marginal adaptation of microfill, nanofill and nanohybrid composites in prepared class II cavities.

Materials and Methods

Standardized Class II Mesio-Occluso-Distal cavities were prepared in 90 intact human mandibular premolars with the gingival floor ending 1mm coronal to the CEJ in the mesial side and 1 mm apical to CEJ in the distal side. Restored teeth were then divided into two main groups. Group 1 for microleakage evaluation (n=45). Group 2 for marginal adaptation evaluation (n=45). Group 1 was then further subdivided into Group 1a (Filtek Z350 nanofill composite), Group 1b (Herculite précis nanohybrid composite) and Group 1c (Heliomolar microfill composite). Similar grouping was done in Group 2 (Marginal adaptation). For microleakage evaluation, the restored teeth were stored in a incubator at 37°C for 24 hours followed by thermocycling. Nail varnish application was done, except for an area approximately 1 mm around the margins of the restoration. Then the specimens were stored in 0.2 % methylene blue aqueous solution for 24 hours. After which the samples were sectioned mesiodistally by using a fine grit diamond disk. Microleakage for the sectioned specimens was evaluated by using a stereomicroscope. For the evaluation of marginal

adaptation, scanning electron microscopic analysis was performed, prior and after performing the loading cycles.

Statistical analysis:

For microleakage evaluation, the data was statistically analyzed by using the Kruskal-Wallis test at 0.05 level of significance. For marginal adaptation, the data was statistically analyzed by using ANOVA and Post-Hoc analysis by using Bonferroni Test at 0.05 level of significance.

Results:

The Results of this study indicated that lower mean microleakage scores and higher continuous margin percentages was found for Filtek Z350 Nanofill composite group followed by the Herculite précis nanohybrid composite and finally for Heliomolar microfill composite. For marginal adaptation, statistically significant values were found between all the involved groups. The results were not statistically significant for the microleakage group.