

Effect of resin composite filling techniques and load cycling on resin-dentin interface at the gingival and pulpal cavity walls of class II cavitiesShaymaa M Nagi¹, Eman W Ismail¹, Asmaa Y Harhash² and Mona I Riad³¹National Research Centre, Egypt²Fayoum University, Egypt³Cairo University, Egypt

The aim of this study was to evaluate the effect of resin composite filling techniques and load cycling on resin-dentin interface at the gingival and pulpal cavity walls of class II cavities. Standardized class II cavities were prepared in freshly extracted third molars. All prepared surfaces were bonded with futurabond DC self-etch dual-cure universal adhesive. Specimens were randomly assigned to two experimental groups according to resin composite filling techniques (G); G1; bulk filled hybrid resin composite, or (G₂); incremental filling nano-hybrid resin composite. Restored teeth were subdivided into two subgroups (B); B1; control group (not subjected to load cycling), B2; subjected to load cycling (90 Newton 5,000 cycles, 3 cycles/ seconds). Restored teeth were sectioned into sticks for micro-tensile bond strength (μ TBS) testing and ultra-morphological evaluation of resin dentin interface. Results revealed that there were no statistically significant differences between the mean μ TBS values of the two resin composite application techniques p-value=0.087. Pulpal dentin showed higher statistically significant mean μ TBS compared to gingival dentin. Specimens with load cycling revealed a statistically significant lower mean μ TBS to dentin at p<0.001. SEM photomicrographs showed penetration of the resin into the dentinal tubules and the formation of hybrid layer were observed for all groups. Broken resin tags were observed in specimens subjected to load cycling. It could be concluded that resin composite application technique didn't have a great impact on the adhesion of the resin composite. Resin-dentin bonds were prone to deterioration after load cycling which affect the long-term success of restoration.

Biography

Shaymaa M Nagi has completed her PhD from Cairo University, Egypt. She is a Researcher in Restorative and Dental Materials Research Department, National Research Centre, Egypt and Lecturer of Operative Dentistry in the Future University, Egypt. She has published more than 10 papers in reputed journals.

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