Compatibility of Silorane based Composite to Methacrylate based Self Etch Adhesive

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Abstract:
Aim: The present study was made to investigate the compatibility of 3M Filtek Silorane composite to 3M Adper SE methacrylate based adhesive.

Materials and Methods: Ten freshly extracted sound human molar teeth were used in this study. They were divided into two Groups; (A): Filtek Silorane composite/Silorane Adhesive Bond System and (B): Filtek Silorane composite / Adper SE Plus (Self-etch). Subdivisions from each group were subjected to micro-shear bond strength and Nanoleakage assessment by SEM examination. For the micro-shear bond testing, a shearing load with tensile mode of force was applied via materials testing machine at a crosshead speed of 0.5 mm/min. For the Nanoleakage study, dentin slabs with the bonded composite according to each tested variable were prepared These slabs were immersed immediately in the tracer solution of 50 wt% ammoniacal silver nitrate, reduced, and examined under SEM for features of Nanoleakage.

Results: higher μSBS was found with Filtek Silorane composite / Silorane Adhesive group than that with Filtek Silorane composite / Adper SE Plus Adhesive (38.62 and 21.36 respectively). This difference was found to be statistically significant (P-value .014). SEM results revealed minimum leakage at the Filtek Silorane composite/Silorane adhesive in the form of isolated scattered silver depositions in the hybrid layer (HL) and the adhesive layer/composite interface. In group B, features of nanoleakage were grossly observed. Water trees were found to take various patterns. Microscopic gaps of various dimensions were seen in most of studied samples.

Conclusion: Within the limitation of the present study, the null hypothesis was that, there is no difference in the μSBS of Silorane to dentin using different adhesive than the Silorane Adhesive Bond System was rejected. The formulation of Silorane Adhesive Bond System specifically fits the chemistry of Filtek Silorane restoration.

Clinical relevance: The bonding systems cannot be used interchangeably with Filtek Silorane restoration, it is recommended for use with its specific bonding system only

"All authors have made substantive contribution to this study and/or manuscript, and all have reviewed the final paper prior to its submission."