Two-year clinical evaluation of ormocer, nanohybrid and nanofill composite restorative systems in posterior teeth

PURPOSE: To evaluate and compare the 2-year clinical performance of an ormocer, a nanohybrid, and a nanofill resin composite with that of a microhybrid composite in restorations of small occlusal cavities made in posterior teeth. MATERIALS AND METHODS: Thirty-five patients, each with 4 occlusal restorations under occlusion, were enrolled in this study. A total of 140 restorations was placed, 25% for each material: an ormocer-based composite, Admira; a nanohybrid resin composite, Tetric EvoCeram; a nanofill resin composite, Filtek Supreme; and a microhybrid resin composite, Tetric Ceram. Two operators placed all restorations according to the manufacturers' instructions. One week after placement, the restorations were finished/polished and patients were advised to return for follow-up at 6 months, 1 year, and 2 years. All patients attended the 2-year visit where the clinical performance of all restorations was evaluated. Two independent examiners made all evaluations according to the USPHS modified Ryge criteria immediately after placement of restorations and at subsequent recall visits. The changes in the USPHS parameters during the 2-year period were analyzed with the Friedman test. Comparison of the baseline scores with those at the recall visits was made using the Wilcoxon signed rank test. The level of significance was set at \( p < 0.05 \).

RESULTS: All materials showed only minor changes, and no differences were detected between their performance at baseline and after 2 years. Only one ormocer and one microhybrid composite restoration had failed after 2 years. No failure was detected in nanohybrid and nanofill composite restorations. Regarding the clinical performance, there were no statistically significant differences among the materials used (\( p > 0.05 \)).

CONCLUSION: After 2 years, the ormocer, nanohybrid, and nanofill composites showed acceptable clinical performance similar to that of the microhybrid resin composite.

Fracture Resistance of Maxillary Premolars with Class II MOD Cavities Restored with Ormocer, Nanofilled, and Nanoceramic Composite Restorative Systems

Marginal adaptation of ormocer, silorane and methacrylate-based composite restorative systems bonded to dentin cavities after water storage

Objective: This study assessed marginal adaptation of ormocer, silorane and methacrylate-based composite restorative systems bonded to dentin cavities after water storage.

Method and Materials: Cylindrical dentin cavities were prepared on the buccal surfaces after enamel removal of 45 extracted human molars. The cavities were assigned into 3 groups (\( n = 15 \)). Each group was restored with one of three composite/adhesive systems; an ormocer-based (Admira/Admira Bond), a silorane-based (Filtek P90/P90 System Adhesive) and methacrylate-based (Tetric Ceram/Excite). Marginal adaptation was evaluated immediately after polymerization, one month and one year of water ageing and thermocycling. Evaluation was performed under a metallographic microscope by recording frequency of gap-free restorations (GF), width of maximum marginal gap.
(MG), percentage length of debonded margins relative to cavity periphery (DM) and marginal index (MI= MG x DM/100). The results were statistically analyzed with two-way ANOVA and Tukey test at 0.05 = ± .

Results: All the composite/adhesive systems examined exhibited no gap-free restorations at all ageing times. Marginal adaptation was significantly affected by the type of restorative/adhesive system, while water ageing time had no significant effect. Silorane composite restorations exhibited the lowest MG, DM, and MI values while methacrylate composite restorations revealed the highest values. Ormocer restorations showed intermediate values.

Conclusion: Although all examined composite systems failed to achieve gap-free margins with dentin cavity, silorane-based system revealed the best marginal adaptation at all ageing times.

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Effects of phosphoric acid concentration and etching duration on enamel and dentin tissues of uremic patients receiving hemodialysis: an AFM study.

Abstract

PURPOSE:

Using atomic force microscopy (AFM), the purpose was to investigate the effect of phosphoric acid (H3PO4) concentration and etching duration on surface roughness (Ra) and micromorphology of enamel and dentin substrates of uremic patients receiving hemodialysis.

MATERIALS AND METHODS:

Sixty-three enamel and dentin slabs were prepared from 42 sound natural molars collected from uremic patients under hemodialysis and mechanically polished up to 4000-grit roughness. Nine slabs of each substrate were not etched (control group). The remaining slabs were divided into two experimental groups (n = 27) according to etchant concentration (37% or 42%). In each group, 9 specimens were etched for 15, 30, and 60 s. The surface morphology of the control and test specimens was examined by AFM operated in “contact” mode. The obtained Ra was subjected to statistical analysis.

RESULTS:

Statistical analysis showed that increasing the duration of acid application (irrespective of acid concentration and type of substrate) significantly increased the amount of Ra. H3PO4 at a concentration of 42% was more effective at producing Ra than was H3PO4 at 37% for all 3 application times. The Ra quantity produced by H3PO4 at 42% was time specific, with 15 s being significantly less effective than 30 or 60 s. However, 60 s was significantly better than 30.

CONCLUSION:

The findings of this study support the use of 42% H3PO4 for etching uremic hard tooth tissues for 60 s.