

## Surface roughness and microleakage of class V composite restorations : Effect of surface sealing

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### I. Objectives

There were attempts to reduce the microleakage and surface roughness of resin composite. One of them is surface sealing. The purpose of this study was to compare the effect of materials, specifically developed for surface sealing, on microleakage and surface roughness in Class V composite restorations.

### II. Materials and Methods

Twenty five standardized Class V cavity preparations were made on the facial surface of extracted human premolars and were randomly assigned to 5 groups. The teeth were restored with Z-250 resin composite after applying Single Bond adhesive system. Following 7 days storage in distilled water at 37°C, finishing and polishing procedures were done and the restorations were sealed as following systems : No sealing ; Single Bond Adhesive ; Biscover ; Fortify ; Optiguard. Then, toothbrush abrasion test was conducted using a wear testing machine of pin-on disk type under a load of 1.5 N for 35,600 cycles.

Surface roughness was measured by means of profilometer before and after toothbrushing and the results were statistically analysed by using a paired t-test and ANOVA test. The bonded interfaces and the changes of surface roughness were examined by scanning electron micrograph.

For microleakage test, specimens were stained in a 2% methylene blue solution, then longitudinally sectioned and analyzed for leakage at occlusal and cervical interfaces using stereomicroscope and digital camera. The results were statistically analysed by using a Kruskal-Wallis test and Mann-Whitney U test.

### III. Results

1. Surface roughness was increasing in all groups after toothbrushing, but there were no statistically significant differences.
2. There were no statistically significant differences in surface roughness between groups before and after toothbrushing.
3. In SEM observation, surface sealant was partially retained and partially detached in bonded interfaces. Especially, microgap was identified in cervical margins.
4. In microleakage test, a significant difference was observed between the enamel and cervical margins for all groups. There was better seal in the enamel region.
5. In microleakage test, there was a significant difference between groups at occlusal margin. But there was no significant difference between groups at cervical margin.
6. Control group and Single Bond group had significantly better marginal seal at enamel margin than cervical margin. But other surface sealant groups had no significant differences between enamel margin and cervical margin.

### IV. Conclusions

In our study, surface sealant does not seem to reduce the microleakage and surface roughness of class V composite restorations.