

Microleakage of three sealants following conventional, bur, and air-abrasion preparation of pits and fissures

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Summary.

Objectives.

The aim of this study was to compare the microleakage of a filled sealant with a drying agent (UltraSeal XT *plus*), a filled sealant (Prismashield) and an unfilled sealant (Delton), after conventional, bur, and air-abrasion tooth preparation techniques.

Setting.

The study was completed in a clinical setting at the Simulated Practice Environment Clinic, School of Dentistry, University of Western Ontario, London, Ontario, Canada.

Sample and methods.

One hundred and eighty extracted teeth were cleaned and divided randomly into three groups. Group 1 was prepared using acid etch only. Group 2 was prepared with a 1/4 round bur in a low-speed handpiece followed by acid etching. Group 3 was prepared with high speed (120PSI) microabrasion using 27 µm α-alumina particles in a Midwest AirtouchTM unit. The teeth in each group were randomly assigned to one of the three subgroups according to the sealant applied. Subgroup A was sealed with a filled sealant with drying agent, B with a filled sealant only, and C with an unfilled sealant. All teeth were stored in artificial saliva for 7 days at 37 °C. After this, the teeth were coated with nail varnish 1 mm from the sealant and immersed in 1% methylene blue dye for 48 h at 37 °C. Each tooth was sectioned at four locations buccolingually and a total of 665 sections were ranked (0–3) for microleakage. Statistical analysis was completed using the Chi-squared test and Fisher's exact test.

Results.

UltraSeal XT *plus*, the filled sealant with drying agent, showed significantly less microleakage than the other two sealants ($P < 0.05$). Delton, the unfilled sealant, showed significantly less microleakage than Prismashield, the filled sealant ($P < 0.05$). Air abrasion with acid etch showed significantly less microleakage than either bur with acid etch or acid etch alone. There was however, no significant difference between the bur and acid etch tooth preparations ($P < 0.05$).

Conclusions.

UltraSeal XT *plus* was the most effective sealant for preventing microleakage in this study. The most successful method of preparation was air abrasion with acid etch.