

The Effect of Bonding Agents on the Microleakage of Fissure Sealants (in vitro)

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Abstract

Background and Aim: Lack of dental materials with adequate adhesion and sealing properties and the resultant microleakage is a major concern in dentistry. The use of denting bonding agents (DBA) in sealant therapy and their effect on microleakage remains controversial. This study was conducted with the aim to evaluate the level of microleakage in fissure sealants with and without DBA.

Materials and Methods: In this experimental study, 45 sound premolars which were suitable for sealant application were chosen and assigned randomly into three groups. Sealant was applied to all teeth with the same conventional technique. In the first group, fissure sealant was applied without bonding agent, in the second group, it was used with total etch bonding agent (single/3M), and finally in the third group it was applied with self-etch bonding agent (G-bond/GC). Microleakage assessment was done by a stereomicroscope. Results were evaluated with Mann-U-Whitney and one way-ANOVA tests.

Result: This study was performed on 45 tooth samples. In the first group, 7% and in the third group, 7% had no leakage. In the second group, 60% of specimens had no leakage. The amounts of microleakage in control, experimental 1 and 2 were 42.6%, 12% and 37.3% respectively, and their difference was significant ($P < 0.001$). Single-bond significantly increased the retention of sealant ($P < 0.05$).

Conclusion: It seems that the best practice for the placement of sealants remains enamel preparation with acid etch and the use of an intermediate bonding layer. The results showed that using 5th-generation bonding agent in comparison with 7th-generation bonding agent and not using any bonding decreased microleakage.

Keywords: *Fissure sealant, Bonding agent, Microleakage*