Pilot: Marginal Leakage of Composite Restorations on Selectively Excavated Caries Lesions

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Introduction

Modern caries management advocates for selective caries excavation to preserve tooth structure. A marginal seal is critical for the success of a restoration. It is crucial to determine the impact of bonding to dentine caries on microleakage in support of this recommendation.

Objectives

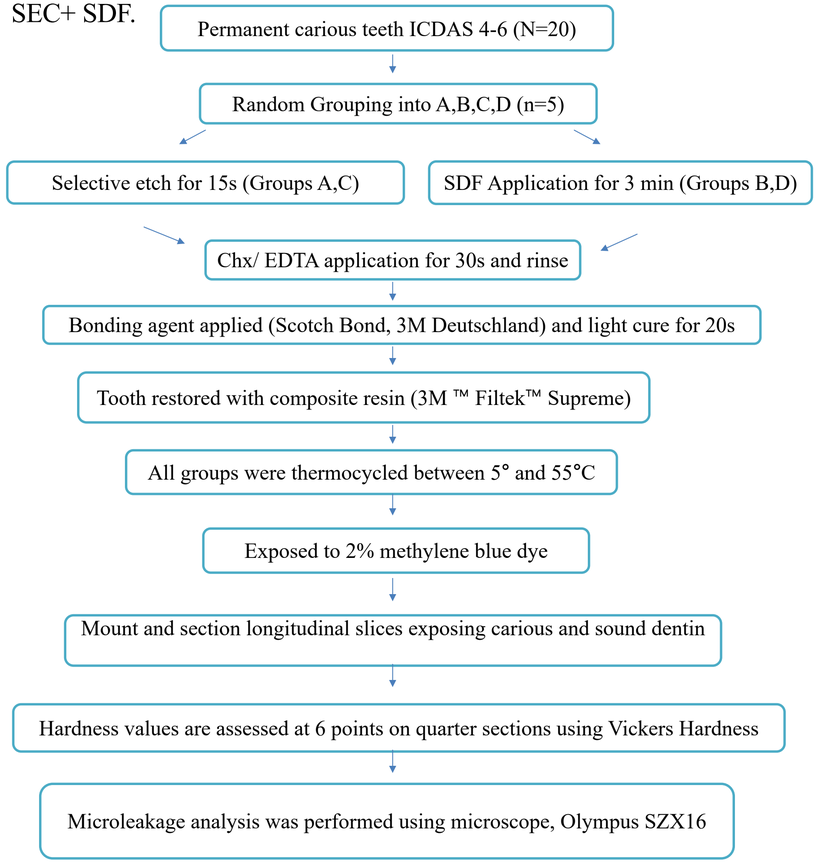
1) **To compare the microleakage of selectively excavated carious lesions (SEC) with completely excavated carious lesions (CEC) after restoring with composite resin and a 6th generation bonding agent in the presence or absence of SDF**
2) **To assess whether there is a correlation between microleakage and Vicker's microhardness of the dentin surfaces after partial or complete caries excavation.**

Null Hypotheses:
(1) There is no significant difference in microleakage between SEC with CEC after restoring with resin composite and a 6th generation bonding agent in teeth treated with SDF;
(2) There is no significant difference in microleakage between SEC with CEC after restoring with resin composite and a 6th generation bonding agent in the absence of SDF;

Alternative Hypotheses:
(1) SDF will microleakage in SEC and CEC teeth
(2) SDF will increase/ decrease the microhardness in SEC and CEC teeth

Methods

Study Sample: Unidentified, extracted, human permanent teeth (N=20) with ICDAS scores 0, 4-6 were separated in to four groups. Group A: CEC+ no SDF; Group B CEC + SDF; Group C SEC+ no SDF; Group D SEC+ SDF.



Results

In this pilot study, 20 teeth were classified into four main groups and analysis was completed on them.

Group A, point A: mean and STD was 1112.0± 1161.0 ,
Group B, point A: mean and STD was 2324.8± 1265.5 ,
Group C, point A: mean and STD was 365.6± 393.6,
Group D, point A: mean and STD was 674.5± 1195.7 .

Figure 1. Means and STD for Microleakage A and B

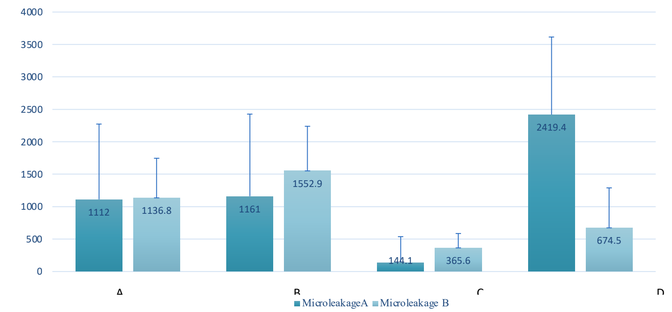
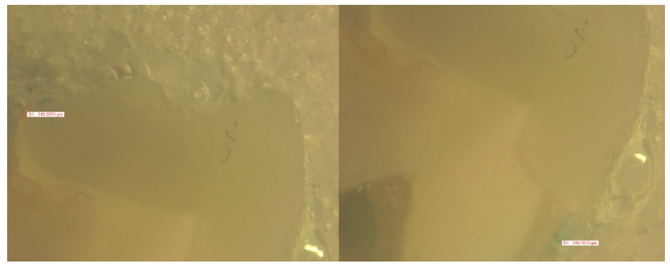


Table 1. Correlation Coefficient Values Between Microleakage and Microhardness

	Microleakage: Group A	Microleakage: Group B	Microleakage: Group C	Microleakage: Group D
Microhardness	0.39	-0.44	-0.33	0.33

Picture 1. Microleakage of Sample #16 Point A and Point B



Conclusion

Preliminary results didn't reach significance, sample sizes will be increased in the full study.
There was a trend for decreased microleakage in groups C (SEC and no SDF) and D (SEC and SDF)
There was moderate strength in the coefficient correlation between microhardness and microleakage values in all the groups.
This indicates that higher the microleakage value, the higher value in microhardness and vise versa.