

Micro-tensile bond strength of three-step and self-etching dentin bonding system to caries-affected dentin

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I. Objectives

The objectives of this study were to examine the microtensile bond strength to caries-affected dentin using two different adhesives and to examine whether the thickness of the hybrid layer may contribute to tensile bond strength or not.

II. Material and Methods

Ten extracted human molars with occlusal caries extending into mid-dentin were prepared by grinding the occlusal surface flat. The carious lesions were excavated with the aid of caries detector dye. After the application of Scotchbond Multi-Purpose, and Clearfil SE Bond to the surfaces, a composite resin restorations were placed. The teeth were serially sectioned vertically into 1mm thick slabs, trimmed to yield a 1 mm² area and subjected to the measurement of MTBS after measuring the thicknesses of hybrid layer by confocal laser scanning microscopy. After MTBS testing, failure patterns were evaluated by stereomicroscope.

III. Results

The MTBS of Scotchbond Multi-Purpose to caries-affected dentin was 11.49 and 10.72 for Clearfil SE Bond. There was no significant difference between the two dentin bonding system. The thickness of hybrid layers created by Scotchbond Multi-Purpose were 12.72 and 18.05 for Clearfil SE Bond in caries-affected dentin showed no significant difference. Most of the specimens of both dentin bonding system showed mixed and cohesive failure mode.

IV. Conclusions

MTBS of total-etch and self-etch bonding systems are not significantly different on caries-affected. No correlation was found between the width of the hybrid layer and MTBS.