

Effect of immediate or delayed composite placement on dentinal micro-tensile bond strength

Hyun-Sik Park*, Young-Gon Cho

Department of Conservative Dentistry, College of Dentistry, Chosun University, Gwangju, Korea

I. Objectives

The purpose of this study is to evaluate the effect of immediate or delayed composite placement on dentinal micro-tensile bond strength.

II. Materials and Methods

Caries-free human third molars were used in this study. At first, the occlusal enamel was removed so that the middle dentin was exposed. And then the exposed dentin was polished with 1200-grit silicon carbide paper for the formation of smear layer.

The polished dentin was etched with 32% phosphoric acid, dried with gentle air and applicated by dentin adhesives. The specimens were divided into 12 groups. Single-Bond was used as a adhesive from Group 1 to Group 6. After the application and curing of Single-Bond, composite resin placement was delayed for 5 minutes(Group 2), 10 minutes(Group 3), 15 minutes(Group 4), 20 minutes(Group 5), 30 minutes(Group 6) and polymerized, respectively. One-Step was used as a adhesive from Group 7 to Group 12. After the application and curing of One-Step, the composite resin placements were performed in the same manner as Group 1 to Group 6.

After the storing in distilled water for a day, the specimens were sectioned with low speed diamond wheel saw and made with bar-shaped specimens. Specimens were attached to the testing devices and the micro tensile bond test was performed by E-Z test. The results were analyzed by the use of one-way ANOVA and Turkey test at 0.001 significance level.

III. Results

1. There were no significant statistical differences from Group 1 to Group 4, but Group 5 and Group 6 showed significant differences in comparison with other groups ($p < 0.001$).
2. There were no significant statistical differences from Group 7 to Group 12.

IV. Conclusions

This study suggests delayed composite placement can adversely affect the micro-tensile bond strength in case of Single-Bond, but One-Step may not adversely affected.