The effect of multiple application on microtensile bond strength of all-in-one dentin adhesive systems

Sung-ae Son*, Bock Hur

Department of Conservative dentistry, College of Dentistry, Busan National University, Busan, Korea

I. Objectives

The purpose of this study was to evaluate the effect of multiple application of all-in-one dentin adhesive system on microtensile bond strength using confocal laser scanning microscope and microtensile bond strength test.

II. Materials and Methods

The dentin surface of human molars, sectioned to remove the enamel from the occlusal surface were prepared. In group I, Scotchbond Multipurpose(SM, 3M ESPE) was applied by manufature' s recommended. In group II, after the all-in-one adhesive, Adper Prompt L-Pop was applied for 15 s, and light cured for 10s, the second coat was re-applied and light-cured. In group III, after light-curing the second layer, the third coat was re-applied and light-cured. Specimens bonded with a resin-composite were sectioned into resin-dentin stick for measuring the adhesive layer thickness by confocal laser scanning microscope and evaluating micro-tensile bond strength.

III. Results

The adhesive layers of three-step dentin adhesive system, SM had significantly thicker than 3 coats, 2 coats of Adper Prompt L-Pop($p<0.05$). However, there was no significant differences in bond strengths between SM and 3 coats($p>0.05$). And SM, 3 coats had significantly higher than 2 coats in bond strengths($p<0.05$).

IV. Conclusions

Bonding of this unfilled all-in-one adhesive, Adper Prompt L-Pop to dentin may be improved by application of multiple layer. This ensures that the exposed dentin surface and dentinal tubules are coated with adhesive that is adequately polymerized by multiple application.