Class V Clinical Study Using a Self-Etching Adhesive (5/05)


The purpose of this study was to evaluate the clinical performance of a two-step self-etch adhesive (Clearfil SE Bond, Kuraray, New York, NY) with or without selective enamel etching with phosphoric acid in non-carious class V lesions after two years. One hundred composite-resin restorations were placed by two operators in 29 patients. Clearfil AP-X (Kuraray, New York, NY) hybrid composite resin was used as the restorative material for the 50 pairs of restorations. The restorations were evaluated at baseline, 6, 12, and 24 months for retention, marginal integrity, microleakage, post-operative sensitivity, recurrent caries, and vitality. After two years both groups had a 100% retention rate. In general, no difference in overall clinical performance was found between the groups. Additional selective etching of enamel margins with phosphoric acid resulted in a significantly higher percentage of perfect margins than when the adhesive was applied following a solely self-etch approach. However, the authors noted that the differences were small and clinically insignificant (i.e., viewable only with magnification). Mild post-operative sensitivity and microleakage occurred with only 6% of all restorations on average. No recurrent caries was observed and no teeth became non-vital.

DIS Comment: Resin-based enamel and dentin adhesives may be categorized as either the newer “self-etching” or the more traditional “etch & rinse”. Multiple laboratory and clinical studies are available demonstrating the success of etch & rinse systems. Laboratory studies have shown, in general, an overall downward trend in bond strengths with self-etching systems, especially with the one-step version. Only a limited number of clinical studies are available evaluating self-etching adhesives. Less clinical effectiveness has been recorded for a one-step, self-etch version. Clearfil SE, a two-step self-etching adhesive, has provided excellent bond strengths in the laboratory and has now been shown to be clinically successful in class V lesions.

Reportedly, self-etching adhesives may demineralize enamel less effectively than conventional phosphoric-acid etchants that need to be rinsed off. So far, however, studies have been equivocal with some studies showing that self-etch adhesives bond less effectively to enamel than etch & rinse systems and other studies have found no difference. This clinical study found no overall clinically significant difference between groups with or without selective etching of enamel with phosphoric acid.

The authors speculate that the excellent laboratory and clinical effectiveness of Clearfil SE may be related to its mild acidity and functional monomer, 10-methacryloxydecyl dihydrogen phosphate (10-MDP). Although it only produces a rather shallow hybrid layer within the dentin that is typically mechanically-retained, residual hydroxyapatite crystals around exposed collagen fibrils may be available for additional chemical interaction with the functional monomer. Additionally, the monomer may also chemically interact with the mineral components of enamel.

In general, DIS recommends caution with any new adhesive agent until well-controlled, clinical studies become available.

References