COMMENTARY

INFLUENCE OF PHOSPHORIC ACID PRETREATMENT ON SELF-ETCHING BOND STRENGTHS

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Acid etching is still the most accepted concept in bonding to enamel. With the increased popularity of the self-etching primers and self-etching adhesives, the reliability of these systems on enamel has been of great concern. In particular, bonding to intact enamel has been of great interest since it consists of approximately 70% prismless enamel. In most clinical scenarios, enamel is slightly ground during a bevel or cavity preparation. However, in cases such as bonding of orthodontic brackets or conservative restorative procedures such as diastema closures, bonding should be made on intact enamel.

In a well-designed study, the authors used the "microshear" bond test, which is a novel method of testing the hypothesis that bond strength of current adhesives, irrespective of number of steps taken, would result in similar bond strengths among them as well as between substrates (ie, ground vs intact enamel). The results of this study showed that for intact enamel, best results were obtained with the acid-etching system. However, when enamel was ground, acid-etching plus two-step self-etching systems produced similar and higher bond strengths than did the self-etching adhesive systems. Scanning electron microscopy revealed that when either intact or ground enamel was bonded with the acid-etching system, long resin tags were observed. On the other hand, when the self-etching primer or the self-etching adhesive was used on ground enamel, short tags were observed; when bonded to intact enamel, resin tags were rarely observed.

It is evident from this study's results that bonding to intact enamel with self-etching primers or adhesives is not recommended. This is in accordance with the recommendation by the manufacturers of these systems, which is that the enamel should always be ground when using self-etching systems. The manufacturer of One Up Bond recommends rubbing the self-etching adhesive on the surface instead of leaving it undisturbed. Perhaps a study comparing both application methods on intact and ground enamel would generate interesting results.

Evidently, when bonding to intact or ground enamel, acid-etching systems still provide the most reliable results.

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