COMMENTARY

BOND STRENGTHS OF CURRENT ADHESIVE SYSTEMS ON INTACT AND GROUND ENAMEL

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Acid etching is still the most accepted concept for bonding to enamel; however, with the increased popularity of the self-etching primers and self-etching adhesives, the reliability of their use on enamel has been of great concern. In particular, bonding to intact enamel is of interest since it consists of approximately 70% of 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, bonding is made on intact enamel.

In this well-designed study, these authors have used the microshear bond test, a novel method, to test the hypothesis that bond strength of current adhesives, irrespective of the number of steps, would result in similar bond strengths among adhesives as well as between substrates (ie, ground vs intact enamel). The results of this study showed that for intact enamel, the best results were obtained with the acid-etching system. However, when enamel was ground, both the acid-etching and two-step self-etching systems produced similar bond strengths that were higher than those of the self-etching adhesive system. SEM revealed that when either intact or ground enamel was bonded with the acid-etching system, long resin tags were observed. However, 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 F recommends rubbing the self-etching adhesive on the surface of ground enamel 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 enamel, acid-etching systems still provide the most reliable results.

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