

Phosphoric acid etching for multi-mode universal adhesive

Q Multi-mode universal adhesives can be used in 'etch-and-rinse' or 'self-etch' modes. Is there any consideration for phosphoric-acid etching of enamel and/or dentin in the use of multi-mode universal adhesives?

A Multi-mode universal adhesives (UA) are indicated as either self-etch or etch-and-rinse adhesives, and manufacturers also recommend an alternative 'selective enamel etch' technique. Currently available laboratory data support phosphoric acid selective etching of enamel prior to use of UA to improve bond strength.^{1,2} In another way to improve adhesion to enamel of UA without the use of phosphoric acid etching, increase of application time for 40 seconds rather than 20 seconds and active application (such as rubbing with microbrush) of UA in self-etch mode were suggested to increase the degree of conversion of the adhesive at the interface as well as the resin-enamel bond strength.^{3,4}

When the dentin surface is pre-etched with phosphoric acid, it is thought that resin components of the self-etch adhesive have difficulty in penetrating the exposed collagen network, leading to a decrease in bond strength. Some experimental results showed equivalent dentin bonding quality of UA regardless of phosphoric acid etching,^{5,6} while in other studies additional phosphoric acid etching were beneficial for the dentin bond strength when using UA.^{7,8} In a recent randomized controlled clinical trial, the 36 month clinical behavior of Scotchbond Universal Adhesive (3M ESPE, St. Paul, MN, USA) did not depend on the bonding mode.⁹ However, this type of adhesive was only recently introduced to the market, and there is limited information on the influence of phosphoric acid etching. Therefore, more researches and investigations are needed.

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