Prevention of Secondary Caries by Self-Etching Bonding System (Hybrid Bond)

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Objectives
The study evaluated the influence of a self-etching bonding system (Hybrid Bond (EU) / Brush&Bond (U.S.A.)) on dentin demineralization using extracted human molars.

Materials and Methods

1. Observation of the adhesive interface

2. Test of acid resistance

Results and Discussion

1. Observation of the adhesive interface

It was observed that hybridized dentin (artificial enamel) exists between intact dentin and composite resin by SEM and TEM.

2. Test of acid resistance

It was observed that the self-etching bonding layer had completely inhibited the diffusion of lactic acid and dye penetration. On the other hand, dye penetration was recognized in the untreated dentin that was demineralized by lactic acid.

The Vickers hardness for the coated dentin surface was 40.3 Hv as opposed to the non coated dentin surface at 23.8 Hv.

Conclusions
The results indicated that the diffusion of lactic acid could be completely inhibited by the adhesive resin coating, and the dentin surface hardness could be maintained.

It was determined that secondary caries caused by diffusion of acids could be prevented by this bonding system.