Bond Strength of Caries-affected Dentin Using Thin-film Bonding Agent

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Objectives
To evaluate the characteristics of the thin-film bonding agents, microtensile bond strengths (μTBS) to sound and caries-affected dentins were measured and SEM observations were executed.

Materials and Method

The three self-etching bonding agents

- AQ Bond Plus (JAPAN)
- Brush&Bond (U.S.A.)
- Touch&Bond (U.S.A.)

Microtensile bond test method

1. Built up CR and Light Irradiation
2. 37°C water (1day)
3. Slice
4. SiC Paper (180)
5. Stained with Caries detector
6. Apply (20s)
7. Air
8. Light Irradiation
9. Trimmed (1mm²)
10. C.H.S 1mm/min

Results and Discussion

From the SEM observation, the thickness of all the bonding layers were about 5 microns, and all of the fracture surfaces were cohesive failures in bonding layer or resin composite. The bond strengths of those adhesives to sound or caries-affected dentin were statistically analyzed by ANOVA. The results presented in the table below, indicate that those strengths were not significantly different between sound and caries-affected dentin.

<table>
<thead>
<tr>
<th>Material</th>
<th>Sound dentin</th>
<th>Caries-affected dentin</th>
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<tbody>
<tr>
<td>AQ Bond Plus</td>
<td>32.2 ± 5.4a</td>
<td>33.8 ± 8.4a</td>
</tr>
<tr>
<td>Brush&amp;Bond</td>
<td>30.7 ± 7.7a</td>
<td>32.8 ± 4.4a</td>
</tr>
<tr>
<td>Touch&amp;Bond</td>
<td>24.9 ± 8.1a</td>
<td>27.3 ± 4.4a</td>
</tr>
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Values with same letters are not significantly different by tukey’s test (p>0.05).

Conclusions
The three self-etching bonding agents used, AQ Bond Plus, Brush&Bond and Touch&Bond showed the excellent bond strength to caries-affected dentin.

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