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Does Enamel Sealing Protect Enamel From Polishing Procedures?

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Objectives The effects of abrasive surface treatments on the enamel surface after sealing the neighboring enamel surface with adhesive resins or modeling liquid were evaluated in terms of surface roughness and surface topography.

Methods A composite filling (2x6x2mm) was placed on 54 intact incisor human teeth along the midline, from the cervico-incisal direction. The mesial side of the teeth served as the control group, while the distal sides were used as the experimental group. The application process was as follows: One-step self-etch bond (Optibond All-In-One, Kerr) was applied to the first group, two-step self-etch bond (Clearfil SE Bond, Kuraray) was applied to the second group, and modeling liquid (GC) was applied to the third group and light cured for 10 seconds (Valo, Ultradent). Subsequently, each group was subdivided into three subgroups. In the first subgroup, red and yellow stripe flame-shaped diamond burs were respectively applied to the tooth surface, in the second subgroup, discs (Super-Snap, Shofu) were used, and in the third subgroup, two steps rubber polishers (Clearfil Twist Dia, Kuraray) were applied. Surface roughness was evaluated using a profilometer (SJ-201; Mitutoyo) (n=5) and an AFM device (NT MDT) (n=1). The surface properties of these materials were examined using scanning electron microscopy (SEM) measurements were performed (Evo LS10, Carl Zeiss). The data were statistically analyzed.

Results There was no significant difference among the groups in terms of roughness ($p>0.05$). According to AFM and SEM images bonding residues and fewer stripes and striations were seen on the disc and rubber polisher groups in the sealed areas. Significant stripes were seen in the bur groups.

Conclusions The results obtained suggest that the enamel sealing does not protect the enamel surface against burs. Enamel sealing was able to protect the enamel surface in other polishing processes.