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Evaluation of a New Fluoride-releasing One-step Adhesive
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Abstract:

In this study, a newly developed S-PRG (surface pre-reacted glass-ionomer) filler-containing one-step adhesive, called SI (SI-IB551, Prototype), was evaluated regarding its fluoride release behavior. As a result, fluoride ion distribution in the tooth structures and acid resistance of cavity margins were also evaluated. In addition, Absolute[®] (a fluoride-releasing one-step adhesive; AB) was evaluated in comparison to G-Bond[®] (a non-fluoride-releasing one-step adhesive; GB) which was used as a negative control.

Concentration of fluoride released was measured using a fluoride ion selective electrode after immersion of each material in distilled water. Fluoride distribution in tooth-adhesive interfacial areas was examined with EPMA following cavity preparation in human premolars and having treated resin restorations with each material. To evaluate acid resistance, restored specimens were immersed in an acetic acid buffer (0.2 M, pH 4.5) for 12 hours and then the cavity margins were observed using scanning electron microscopy. Amounts of fluoride released from AB and SI were significantly greater than that from GB. Further, significant differences in fluoride release were detected between AB and SI. A layer of increased fluoride density was clearly detected at the enamel- and dentin-SI interfaces. In terms of acid resistance, an acid resistance zone was also formed adjacent to the tooth-adhesive interface of AB and SI specimens. However, in GB specimen, acid resistance zone was not observed. These findings suggested that one-step adhesives displayed a

favorable fluoride release property, thereby contributing positively to inhibition of recurrent caries.

Key words:

[One-step adhesive](#), [Fluoride-releasing](#), [S-PRG filler](#)

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