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Original Articles

Effects of CPP-ACP Paste on the Shear Bond Strength of Orthodontic Brackets

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Abstract

Objective: To evaluate the effect of casein phosphopeptide–amorphous calcium phosphate (CPP-ACP) paste on shear bond strength and debonding failure modes of orthodontic brackets.

Materials and Methods: Freshly extracted premolars were randomly divided into four groups ($n = 18$) as follows: in groups 1 and 3, the enamel was treated with a solution of CPP-ACP dissolved in artificial saliva; groups 2 and 4 served as controls, and the enamel was treated with artificial saliva. After conventional acid etching, in groups 1 and 2, brackets were bonded using a light-cured bonding system (Bugloo); while in groups 3 and 4, brackets were bonded using a conventional bonding system (Unite Bonding Adhesive). Bonded specimens were subjected to thermal cycling for 1000 cycles before debonding procedures. After debonding, teeth and brackets were examined under a stereomicroscope at 10 \times magnification to determine whether any adhesive remained, in accordance with the adhesive remnant index. The acid-etched enamel surfaces were also observed using scanning electron microscopy after treatment with and without CPP-ACP paste.

Results: The shear bond strengths of group 1 were significantly higher than those seen in group 2 ($P < .01$). There was no significant difference in the shear bond strengths of groups 3 and 4 ($P > .05$). Scanning electron microscopic observation showed that the pretreated enamel surface was rougher than that of the control surface after acid etching.

Conclusion: The use of CPP-ACP can be considered as an alternative prophylactic application in orthodontic practice since it did not compromise bracket bond strength.

Keywords: [Shear bond strength](#), [Casein phosphopeptide–amorphous calcium phosphate](#), [Enamel](#), [Orthodontic brackets](#)

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