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In vivo bonding of orthodontic brackets with glass ionomer cement

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ABSTRACT

The adhesion of orthodontic bracket bases was examined in vivo 24 to 32 hours after bonding with glass ionomer cement (GIC). In contrast to bonding with composite resin, with GIC there is no need to etch the enamel surface of the tooth. Conventional metal brackets with mesh pad, bonded with GIC, showed an average shear bond strength of 3.6 ± 1.1 MPa, approximately one-fourth the bond strength of composite resin. Fracture sites were found exclusively at the mesh/GIC interface. Bonding between GIC and enamel must, therefore, be stronger than bonding between conventional resin and enamel. An experimental attachment with a modified base, consisting of brass rings 4 mm in diameter with a retention groove, was designed. In these experimental cases, fractures were found at the base/GIC interface and at the enamel/GIC interface. Shear bond strength of the experimental base was as high as 5.8 ± 1.0 MPa. These values approached those of brackets bonded with composite resin and acid etching. Bond strengths of up to the 3 MPa which occur during orthodontic treatment were achieved. Clinical trials with GIC bonding thus seem feasible and are being initiated.

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