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Bond strengths of two ceramic brackets using argon laser, light, and chemically cured resin systems

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ABSTRACT

The present study compared tooth-bracket bond strengths using two types of ceramic brackets and three methods of polymerization: argon laser, conventional light, and chemical. Ninety extracted human premolars were prepared for bonding with pumice and gel etchant. Using single crystal alumina brackets with silanated bases, three groups of 15 teeth were bonded with one of the three polymerization methods. Similarly, three groups of 15 teeth were bonded with polycrystal alumina brackets with nonsilanated bases. Each bonded bracket was tested on an Instron tensile testing machine in shear mode to determine shear debonding strength. Fracture sites were recorded. Results demonstrated that (1) all combinations produced shear bond strengths greater than those considered clinically acceptable, (2) the mean shear bond strengths of the single crystal alumina brackets with silanated bases were significantly higher than those of the polycrystal alumina brackets with nonsilanated bases, and (3) no enamel fractures were found on debonding the chemically cured brackets while the light and laser groups exhibited a 10% rate of enamel fracture on debonding.

KEY WORDS: Bond strength, Ceramic brackets, Resin, Argon laser.

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