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Optimization of a procedure for rebonding dislodged orthodontic brackets

B. Mui, BSc, DDS;[a] P.E. Rossouw, BSc, BChD, BChD(hons), MChD, PhD;[b] G.V. Kulkarni, BDS, LLB, MSc, Dip Paedo, PhD[c]

[a]B. Mui, Department of Orthodontics, University of Toronto.

[b]Dr. P.E. Rossouw, Department of Orthodontics, 124 Edward Street, Faculty of Dentistry, University of Toronto, Toronto, Canada M5G 1G6. P.E. Rossouw, head, Department of Orthodontics, University of Toronto.

[c]G.V. Kulkarni, Department of Paediatric Dentistry, University of Toronto.

ABSTRACT

The purpose of this study was to compare shear bond strength (SBS) of bonded and rebonded orthodontic brackets following a variety of commonly used conditioning treatments and using both light-cured and self-cured composite resin systems. Brackets debonded during the initial determination of SBS were rebonded after the removal of residual resin from enamel surfaces using five different treatments: (1) Remove residual resin using a tungsten carbide bur, re-etch enamel surface, then bond a new bracket; (2) Remove resin from the base mesh with micro-etching then rebond the same bracket, (3) Remove residual resin from the enamel surface using resin-removing pliers, recondition the enamel with an air-powder polisher, then bond a new bracket; (4) Remove residual resin using a rubber cup and pumice, then bond a new bracket; (5) Remove residual resin using pliers alone, then bond a new bracket. The results revealed that the light-cured system produced higher shear bond strength in the initial bond than the self-cured system ($p<0.005$). Reconditioning the enamel surfaces using a tungsten carbide bur and acid-etching gave the highest SBS (difference 5.8 MPa; $p<0.01$) and clinically favorable fracture characteristics. The data suggest that the optimal procedure for rebonding dislodged orthodontic brackets is to resurface the enamel using a tungsten carbide bur, acid-etch the enamel, and use a new or re-use an old bracket after microetching.

KEY WORDS: Shear bond strength, Rebond strength, Reconditioning, Self-cured, Light-cured.

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