Fracture Resistance of Mutilated Maxillary Premolars Restored with Different Direct and Indirect Restorations

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Abstract:

Objectives: This study aimed to evaluate fracture resistance of mutilated maxillary premolars with Class II MOD cavities restored with direct and indirect restorations.

Materials & Methods: Sixty maxillary premolars with standardized MOD cavities were divided into six groups (10 each) according to restorative material; G1 (PG): intact as positive control. G2 (NG): cavities unrestored as negative control. G3(NCG): restored using nano-ceramic resin composite. G4 (BSG): restored using bulk fill composite. G5 (BEG): restored using short fiber-reinforced composite. G6 (IBG): restored using nano hybrid CAD\ CAM composite blocks. Then specimens were thermo-cycled for 5000 cycles. Specimens were subjected to compressive axial loading until fracture in a universal testing machine with crosshead speed 1mm / min. Maximum breaking loads were recorded in Kilo Newton by computer.

Results: Statistical analysis showed a significant difference between study groups ($P<0.001$). G1, G6 and G5 yielded the highest maximum load mean values. Mean value of G4 did not differ from G6 and G4. Mean value of G3 was lower than G1, G6, G5 and G4, but higher than G2. G2 showed the lowest mean value.

Conclusion: It was concluded that, fracture resistance of maxillary premolars with MOD cavities is greatly influenced by the restorative material chosen.

Keywords:

Fracture Resistance, Nano-Ceramic composite, Bulk Fill Composite, Short Fiber-Reinforced Composite, CAD\ CAM Composite Blocks.