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Acta Medica Iranica

2009;47(4) : 99-104

Original Article

Fracture Strength and Bending of Fiber-Reinforced Composites and Metal Frameworks in Fixed Partial Dentures

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Received: October 20,2007

Accept : February 20,2008

Available online: April 19,2009

Abstract:

Objective: This in vitro study evaluated the fracture strength and bending amount of twotypes of fiber reinforced composite (FRC) and cast metal frameworks used for fabrication of inlay fixed partial dentures (IFPDs).

Materials and Methods: Seventy-two extracted first maxillary premolars and molars (36 each) were embedded in acrylic resin to represent a missing of second maxillary premolar. FRC IFPDs were fabricated using Stick and Fiber-Braid fiber bundles and IFPDs using cast metal alloy (12 for each group). The specimens were stored for 2 weeks at 37°C (SD=1) in distilled water, thermocycled (5-55°C, x 2500) and statically loaded to fracture. The initial bending prior to fracture was evaluated. The data were analyzed using paired t-test and ANOVA test.

Results: The fracture strength was significantly higher in the FRC groups ($P<0.05$); also, the fracture strength was significantly higher in Stick group than Fiber-Braid group ($P<0.05$). The amount of bending was significantly greater in the FRC groups ($P<0.05$). The amount of difference in bending between the two groups of FRC was not statistically significant.

Conclusion: Within the limits of this in vitro study, the results suggest that the FRC IFPDs can be used as a conservative, esthetic alternative to the IFPDs with cast metal frameworks. The results of this study should be confirmed by long-term clinical investigations.

Keywords:

Denture , Partial , Fixed , Resin-Bonded , Inlays , fiberglass reinforced poly-mers

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