

Fixed partial dentures: all-ceramics, fibre-reinforced composites and experimental systems.

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The aim of this in vitro study was to compare the fracture strength of three-unit FPDs (fixed partial dentures) and three-unit inlay FPDs after a simulated 5-year oral wearing period. The restorations were made of a pressable all-ceramic (Empress 2) and two specially designed, experimentally fixed partial dentures combining ceramics with dental composite. Three-unit FPDs and inlay FPDs were manufactured and were adhesively luted onto human molars. After thermal cycling and mechanical loading in an artificial environment, the fracture strength was determined. Zircon-based milled ceramic (Lava) three-unit FPDs were used as a control. The zircon ceramic and the fibre-based ceramic three-unit FPDs showed median fracture values between 1000 and 1400 N. For composite veneered zircon FPDs a fracture strength of about 800 N and for all-ceramic Empress 2 of about 350 N could be determined. The results for the inlay FPDs were between 1300 N and 1400 N for FRC/ceramic, 1000 N for zircon/composite and 500 N for all-ceramic restorations. The all-ceramic showed higher fracture resistance applied as inlay FPDs. The described hybrid techniques combining ceramics and composites could represent an interesting procedure for further investigations and, eventually, clinical implication.

PMID: 12950967 [PubMed - indexed for MEDLINE]