

In-vitro study of fracture strength and marginal adaptation of fibre-reinforced adhesive fixed partial inlay dentures.

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The aim of this study was to examine in-vitro whether adhesive fixed posterior inlay dentures (AFPID) made with the fibreglass-reinforced Vectris/Targis system (Ivoclar, Schaan, FL) have a fracture strength and a satisfactory marginal adaptation which can occur under clinical conditions. Extracted human third molars were embedded in a PMMA resin 10 mm apart to represent a molar gap. Two preparation methods were used: a box-shaped preparation technique (n = 8) and a tub-shaped preparation technique (n = 8). All AFPIDs were adhesively inserted using the dual curing composite cement, Variolink-high-viscosity (Vivadent, Schaan, FL). After thermocycling and mechanical loading (TCML: 6000 x 5 degrees C/55 degrees C, 1.2 Mio x 50 N, 1.66 Hz) in an artificial environment, the bridges were loaded to failure. Marginal adaption was investigated before and after TCML with the replica technique. After TCML, no significant difference was found in fracture strength between tub-shaped-preparation (median = 722 N, bending median = 0.9 mm) and box-shaped preparation (median = 696 N, bending median = 1.2 mm). A 'perfect margin' was observed in more than 60% of the investigated areas in both preparation techniques. With these values, the bridges can occur under clinical conditions and thus a clinical employment should be considered.

PMID: 10071475 [PubMed - indexed for MEDLINE]