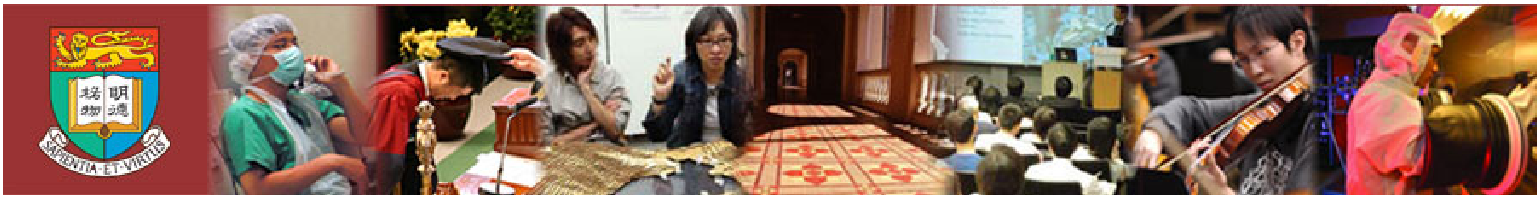

LOAD-BEARING CAPACITY OF FIBER-REINFORCED FIXED DENTAL PROSTHESES WITH CAD-CAM PONTIC

OBJECTIVES: The aim of this study was to evaluate the load-bearing capacity of three-unit fiber reinforced composite (FRC) fixed dental prostheses (FDP) with three different types of pontics.

METHODS: Inlay preparations for retaining FDP were made to lower second premolar and second molar of a phantom model. We aimed to replace the lower left first molar using a pontic. Twenty four FDPs with fiber-reinforced composite frameworks (everStick, StickTech-GC) were fabricated. Two continuous unidirectional fiber reinforcements were attached with flowable composite (Stick® FLOW), and composite (G-ænial, GC), between inlays of the abutment. One inlay preparation model with the FRC framework was scanned by CEREC. An artificial tooth of a denture was scanned by CEREC to multiply its form to the ceramic pontics. The FDPs were divided into three groups (n=8/group). In Group-1, pontics were fabricated conventionally with composite resin (G-ænial, GC) and one transversal fiber reinforcement. In Group-2, the pontics were artificial denture teeth (Heraus-Kulzer). Group-3 had an IPS-Empress CAD pontic (Ivoclar Vivadent) milled by CEREC. The denture tooth and ceramic pontics were attached to the fiber frameworks by composite resin. The FDPs were statically loaded from the pontic until the final fracture. Initial fracture was recorded from the load-deflection graph. Graph data were then analyzed using ANOVA in SPSS.

RESULTS:

Group	Composite pontic	Denture tooth pontic	Ceramic pontic
Final fracture load (N)	773 (100)^{a}	871 (150)^{a}	547 (122)^{b}
Initial fracture load (N)	629 (105)^{A}	691 (153)^{A}	533 (135)^{A}

Same superscript letter above value revealed no significant differences ($p<0.05$)

Analyses revealed no statistical differences between groups in initial fracture loads ($p>0.05$). However, final fracture loads of FDPs with composite and artificial denture tooth pontics, had significantly higher fracture loads than FDPs with ceramic pontic ($p<0.05$).

CONCLUSIONS: The results of this study suggest that fiber-reinforced composite FDPs with CAD-CAM fabricated ceramic pontic, had lower durability than FDPs with composite and denture tooth pontic. Further studies will be focused to improve bonding of ceramic pontic to fiber framework.