

The fracture resistance of ceramic inlay-retained fixed partial dentures (CIRFPDs) was studied. Thirty CIRFPDs were constructed using ice zircon milled ceramic material. Specimens were divided into three groups, 10 specimens each, according to the abutment preparation: inlay-shaped (occluso-proximal inlay + proximal box), tub-shaped (occluso-proximal inlay), and proximal box-shaped preparations. Each group was then subdivided into two subgroups of five specimens each, according to the span of the edentulous area representing a missing premolar or molar. All specimens were subjected to a fracture resistance test. CIRFPDs with inlay-shaped retainers showed the highest fracture resistance values for missing premolars and molars. CIRFPDs with box-shaped retainers showed lower fracture resistance values. Statistical analysis revealed a significant difference between the three tested CIRFPD designs. There was a statistically significant difference between CIRFPDs constructed for the replacement of molars and those constructed for the replacement of premolars. The CIRFPD constructed for the replacement of molars gave lower fracture resistance values with the three tested designs. All the fracture resistance values obtained in this study were superior to the assumed maximum mastication forces. Failure mode was delamination and chipping of the veneering material. There was a statistically significant difference between the three designs of CIRFPDs tested. There was a statistically significant difference between CIRFPDs constructed for the replacement of molars than those constructed for the replacement of premolars. The CIRFPDs constructed for the replacement of molars gave lower fracture resistance values with the three tested designs. All fracture resistance values obtained in this study were superior to the assumed maximum mastication forces.

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