

**Zirconia resin-bonded fixed partial dentures in the anterior maxilla.**

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**OBJECTIVE:** To determine the fracture resistance of resin-bonded fixed partial dentures (RBFDPs) by examining the influence of framework design and abutment mobility.

**METHOD AND MATERIALS:** RBFDP frameworks were made of zirconia (Cercon Base, Degudent) or a nonprecious alloy (reference; Dentitan, Elephant Dental) and veneered with ceramic (Cercon Ceram S, Degudent). The zirconia framework design varied between a 2-retainer RBFDP with 3 different levels of tooth mobility (groups 1 to 3) and a 1-retainer cantilever version with 2 different grades of tooth mobility (groups 4 and 5). To achieve different mobility (rigid, medium, movable), the roots of the teeth were covered with a polyether material of different thicknesses. All RBFDPs were adhesively luted on prepared human teeth (Panavia 21 Ex, Kuraray). The specimens were mechanically ( $1.2 \times 10^6$ ; 25 N) and thermally (6,000 x 5 degrees C/55 degrees C; 2 minutes per cycle) cycled and finally loaded to failure (universal testing machine 1445, Zwick) at a speed of 1 mm/min. **RESULTS:** The fracture force of the reference RBFDP (541 N) was significantly higher than that of both cantilever RBFDPs (group 4 = 271 N, group 5 = 104 N) and one 2-retainer group with rigid abutments (group 3 = 150 N). With 2 movable abutments, the fracture force increased to 261 N (group 1) and with mixed movable/rigid teeth to 324 N (group 2). Zirconia RBFDPs showed improved survival with increased tooth mobility, but the framework design showed only a minor influence on loss rate and fracture resistance. **CONCLUSIONS:** Assuming chewing forces in anterior areas between 200 and 300 N, 1- and 2-retainer zirconia RBFDPs may be suitable as minimally invasive provisional alternatives to metal-supported RBFDPs.

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