

## **Resistance to Cyclic-Loading of 3-Units Sintered Fixed Partial Dentures**

*D. NATHANSON, Boston University, MA, USA, and T.Y.  
MARGHALANI, King Abdulaziz University, Boston  
University, Jeddah, Saudi Arabia*

### **Objectives:**

This study compares the effect of cyclic loading on load to failure of fixed partial dentures (FPD) fabricated with casting or sintered alloys.

**Materials and Methods:** Three unit FPDs were fabricated from two sintered alloys, GroupA SinterKor (Pentron); GroupB. Captek (Precious Chemicals) and one high noble cast alloy: GroupC. RxG (Pentron). Plastic teeth (mandibular first premolar and first molar) set in a typodont were prepared for a three unit FPD. This master model was duplicated into multiple epoxy models. FPD frames (n= 10 per group) were fabricated in uniform dimensions and veneered with porcelain. FPDs were cemented to their respective models with zincphosphate cement. In each group 4 FPDs were statically loaded to failure. The remaining FPDs were cycle-loaded (100,000 eye. at 35% static failure load). FPDs surviving 100,000 cycles were static loaded to failure.

**Results:** Mean static loads-to-failure (Newtons) were: GroupA 753.03±105.54; GroupB: 965.83±39.26; GroupC: 543.85±163.4. The failure load for GroupB was significantly higher than GroupC (Post Hoc test, P=.005), but not different from GroupA (P=.112). GroupA was not different from GroupC (P=.091). During cyclic loading, three GroupC FPDs and One Group A FPD fractured, while all Group B FPDs survived. Mean failure loads after cyclic loading were: GroupA 701.98±122.6; GroupB: 937.08±163; GroupC 581.83±120.85. GroupB was significantly higher than GroupA (P=.014).

**Conclusions:** Sintered alloy FPDs (GroupB) exhibited significantly higher resistance to static failure loads than cast alloy (GroupC) FPDs (P=.005), but not different from the sintered alloy (GroupA) FPDs (P=.112). After cyclic loading, GroupB recorded significantly higher resistance to load compared with GroupC (P=.014), but not different from GroupA (P=.082). In this study sintered alloy FPDs had higher or similar resistant to loading compared to cast alloy FPDs.