

## Summary

The OT CAP-retained removable partial denture and the cantilever fixed partial denture are two unilateral prostheses that provide a solution to the problems of unilateral distal extension base cases. This study was done to compare between the stresses transmitted to the abutment teeth by these two different treatment plans using electrical strain gauge technology.

An acrylic resin model was constructed with missing molars on one side resembling a mandibular Kennedy class II partially edentulous case. The premolars on the edentulous side were prepared and wax patterns for two full coverage splinted crowns were fabricated. The male parts of the OT CAP attachment system were attached to the distal surface of the wax pattern of the crowns and the entire assembly was casted as one unit. The superstructure of the OT CAP attachment system was then constructed. A metal loading beam with anterior and posterior loading points was constructed and soldered to the superstructure at the occlusal level for loading the OT CAP-retained removable partial denture.

For standardization purposes, the splinted metal crowns with the OT CAP bar carrying the male parts of the attachment system was considered as the cantilever fixed partial denture in this study.

Electrical strain gauges were bonded to the buccal, mesial and distal surfaces around the first and second premolars on the edentulous side.

Loading of the OT CAP-retained removable partial denture was done first.

Then, the superstructure was removed and the male parts of the attachment system were loaded directly to resemble loading of the cantilever fixed partial

denture. Microstrain values were recorded and analyzed.

The results showed that the OT CAP-retained removable partial denture transmitted less stresses to the abutment teeth than the cantilever fixed partial denture. Furthermore, deformation of the cantilever fixed partial denture took place upon loading its posterior pontic. In addition, the highest stresses were recorded on the mesial side in both designs.

It could be concluded from the results of this study, that the elastic shock-absorbing quality of the OT CAP attachment system played a role in the reduction of the stresses transmitted to the abutment teeth. This may favor the use of this prosthesis in the treatment of unilateral distal extension base cases.