

The effect of alveolar bone loss on the load capability of restored endodontically treated teeth: a comparative in vitro study.

[Naumann M](#), [Rosentritt M](#), [Preuss A](#), [Dietrich T](#).

Department of Prosthodontics and Geriatric Dentistry, Charité, Humboldt University, Augustenburger Platz 1, Berlin, Germany. michael.naumann@charite.de

OBJECTIVES: The aim of the present investigation was to study the influence of a reduced bone support on the fracture resistance of endodontically treated teeth restored with glass fibre-reinforced posts (FRC). **METHODS:** 30 caries-free maxillary central incisors were divided into 3 groups (n=10). Endodontic treatment was performed. Teeth were flattened 2 mm above the cemento-enamel junction. Group I (control) simulated a clinical situation without horizontal bone loss. In group II a horizontal bone loss of 25% and in group III of 50% was simulated. All specimens received FRC posts and composite core restorations. All-ceramic crowns were adhesively cemented. Specimens were exposed to thermal cycling and mechanical loading (TCML) and finally statically loaded until failure in a universal testing machine (v=1 mm/min). Non-parametric tests were used to compare median fracture loads between groups. Fracture modes were compared using Fisher's exact test. **RESULTS:** The median fracture load values (min/max) in [N] were: group I=501 (326/561), group II=422 (323/495); group III=352 (266/406), p=0.004. Two specimens in each group II and III failed during TCML. Statistical analysis revealed statistically significant differences between all test groups regarding maximum fracture load and mode of fracture. **CONCLUSIONS:** The fracture resistance of endodontically treated teeth restored adhesively with a FRC post, composite core, and all-ceramic crown is dependent on the level of surrounding supporting periodontal bone. Loss of alveolar bone loss due to periodontal disease may lead to an increased risk of failure.

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