Current Issue
Browse Issues
Search
About this Journal
Instruction to Authors
Online Submission
Subscription
Contact Us
RSS Feed

Acta Medica Iranica
2009;47(4) : 69-76

A Comparison of the Fracture Resistance of Endodontically Treated Teeth using Three Different Post Systems

M. Sadeghi

Abstract:

Statement of problem: It is yet unclear whether fiber-reinforced composite posts can enhance the mechanical properties and prevent vertical fractures of teeth under chewing loads. Purpose: The purpose of this study was to compare the fracture resistance and failure mode of endodontically treated teeth restored with three different post systems. Materials and Methods: Thirty-six maxillary canines were randomly divided into three groups (n=12). All teeth received endodontic therapy and one of three post systems of cast post-and-core, zirconia fiber post, and quartz fiber post. Cast posts-and-cores were cemented using zinc phosphate cement, fiber posts were luted with dual-cured resin cement, and composite cores were prepared. Compressive load was applied at a 135° angle to the long axis of the tooth at a crosshead speed of 1mm/min until fracture occurred. One-way ANOVA and Tukey-Karmer test were used to determine the difference of the failure loads between the groups (α=0.05). Results: The mean values (SD) for fracture resistance were 1631(803), 513(348) and 789(390) N in the cast post-and-core, zirconia fiber post and quartz fiber post groups, respectively. Teeth restored with cast posts-and-cores exhibited significantly higher resistance to fracture ($P<0.01$); however, 92% of the fractures occurred in the tooth structure. There was no statistically significant difference in fracture resistance between the zirconia fiber and quartz fiber post groups. Fracture mainly occurred in the composite cores of these groups. Conclusion: This study showed that the fracture resistance of cast post-and-core was significantly higher than zirconia and quartz fiber posts; however, the failure mode was more favorable in teeth restored with fiber posts.

Keywords:

Post-and-core technique ، Zirconia fiber post ، Quartz fiber post ، Cast post-and-core ، Endodontically treated teeth

TUMS ID: 3314

Full Text HTML Full Text PDF 166 KB

top