

Effect of Ferrule Height and Post Length on Mechanical Stress and Displacement of Endodontically Treated Maxillary Central Incisor: A Finite Element Analysis

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Abstract

The successful of endodontic treatment for patients suffering with root canal problems is mainly dependent on several factors such as design, material and length of the post and ferrule. The survival of maxillary central incisor after root canal treatment is mainly associated with the behavior of the dental post implant embedded in the teeth that acts as a replacement of the pulp. There are few consensuses found on the effect of ferrule height and post length with regard to the mechanical assessments of endodontically treated maxillary central incisors through numerical analysis. Through this study, dental posts with different lengths—11, 13.5 and 16 mm—were investigated using three different ferrule heights—0, 2 and 4 mm—via three-dimensional finite element analysis. The results showed that the stress level within the dentin and post

decreased as the dental post length and ferrule height increased. Also, the increase in ferrule height considerably decreased the displacement of the core body. Both ferrule height and post lengths showed a significant effect on the mechanical assessment of treated teeth; however, the ferrule height was found to be superior.

Keywords

Ferrule height Post length Endodontics Stress Displacement
Finite element analysis

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