عنوان مقاله:

Evaluating the Effect of Dental Filling Material and Filling Depth on the Strength and Deformation of Filled Teeth

محل انتشار:

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خلاصه مقاله:

ackground and aim: It is important to evaluate the effect of the type of filling material on deformation and strength of tooth after filling and also the effect of filling depth on quality of restoration of a decayed tooth. Material and Methods: The Orthopantomogram (OPG) of the first and second molars of a 28-year-old man was made and the teeth were 3D modeled. The stress-deformation analysis was then performed on the models in the three states of normal tooth, tooth filled with amalgam and tooth filled with composite using finite element method under a distributed load of 400N equivalent to chewing force. Two values (1/2 and 1/3 of the tooth height) were considered for filling depth in the analyses. Results: The results showed that the normal first molar was exposed to a 7.2% greater risk of dental injuries compared to the normal second molar and also a greater stress is created in it when it is filled with composite. The first molar filled with a composite material is 13.7% weaker than the normal tooth while it is almost as strong as a normal tooth when it is filled with amalgam. The effect of the type of filling material on the strength and deformation of the second molar was trivial. Conclusion: Amalgam is a more proper dental filling material for the first molar although a 16.7% change in drilling depth is needed for tooth preparation. Dental filling material and filling depth have a small effect on the strength and deformation of filled second molars.

کلمات کلیدی:

Amalgam, Composite, tooth strength, filling depth, tooth deformation