

Finite Element Analysis of Dental Implant for Prosthesis

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Abstract : The purpose of this investigation was to locate restorative bio-materials for the manufacture of implants and crowns. A three-dimensional (3D) finite element analysis (FEA) was carried out to evaluate the stress distribution in the implant and abutment with several types of bio-materials and various prosthetic crowns. While the dental implant, abutment, and screw were subjected to a vertical impact force, the effects of mechanical characteristics such as Young's modulus and Poisson's ratio were evaluated and contrasted. Crowns are made from zirconia, cobalt, ceramic, acrylic resin, and porcelain materials. Implants are made from materials such as titanium, zirconia, PEEK, and CFR-PEEK. SolidWorks was used to create the 3D geometry, and Ansys Software was used to analyze it. The results show that using CFR-PEEK implants and an acrylic resin crown resulted in less bone stress than using alternative materials. In order to reduce the amount of stress on the bone and possibly prevent implant failure, the study's findings support the use of a CFR PEEK implant, abutment, and crown in bruxism patients.

Keywords : biomaterials, implant, crown, abutment

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