6. Finite Element Analysis of Bone-Implant Biomechanics Featuring Various Osseointegration Conditions with a New Implant Design

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Abstract

This paper analyzes the biomechanical effects of a new dental implant design on peri-implant bone with various osseointegration conditions. Finite element analysis was used for this purpose. Peri-implant bone stress distribution was analyzed during a 100 MPa loading on bone types II, III and IV at different osseointegrated conditions (25%, 50%, 75% and 100%). The new designed model of the implant produced a widening in stress distribution and reducing the equivalent strain that caused by existing implant model during the loading of the tooth. The result indicates that by using this new implant design, the stress and strain distributions were much better than those of the existing implant design.

Keywords: Finite element analysis, Premolar teeth, Dental implant, Stress and strain, Osseointegration

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