

A Three-Dimensional Finite Element Stress Analysis of Implant-Supported Prosthesis and Its Supporting Tissue in the Edentulous Mandible

Part 2. Comparative Analysis with Three Occlusal Loading Conditions in Fixed Prosthesis

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Abstract

In this study, the authors evaluated stress distributions and displacements in the implant-framework system, cortical bone, cancellous bone and artificial teeth of the complete implant-supported mandibular fixed prosthesis under different vertical loading conditions. They were a uniform occlusal loading in centric occlusion, a concentrate occlusal loading in a posterior tooth bilaterally, and a protrusive occlusal loading on the cusp tips or incisal ridges of the anterior teeth. The results showed as follows.

1. Under three occlusal loading conditions the stress in implant cervical regions and the surrounding bone interfaces increased, especially in the blade implant area. Stress distributions in implant-frameworks and supporting bone were even and similar to each other.

2. The complete implant-supported fixed prosthesis of the mandible could transfer the load effectively, which was mainly completed by framework with good rigidity.

Key words: load dental implant stress analysis edentulous mandible

硝苯吡啶致牙龈增生一例

周鸿耀 于惠轩 陈惠珍

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