

Stress analysis of the tissue around the abutment tooth by the difference in the keeper angles of the most posterior molar in magnetic attachment dentures

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Abstract

Application of the magnetic attachment to the most posterior molar is effective as the most posterior support region of the denture. However, a good clinical prognosis is rarely provided for the abutment tooth is located under the denture base with poor self-cleaning property. In this study, we investigated the mechanical influence of angular difference of the keeper surface applied to the most posterior molar to the abutment teeth and surrounding tissues using three dimensional finite element method.

The analysis model was constructed using a mandibular cast model manufactured by Nissin Co., Ltd. In the prosthetic design, the overlay prosthesis was made by applying a magnetic attachment to the mandibular left second molar. Analysis items were modeled by setting the keeper surface parallel to the occlusal plane and a model in which the keeper surface was set perpendicular to the tooth axis of the abutment.

From the analysis results, relaxation of the stress distribution in the mandibular left second molar was observed in the model that the keeper surface was set perpendicular to the tooth axis of the abutment. In addition, decrease of the periodontal ligament burden area and increase of mucous burden area could be confirmed.
