Stress distribution around maxillary anterior implants as a factor of labial bone thickness and occlusal load angles: a 3D-finite-element analysis.

Abstract

Abstract ABSTRACT
Purpose. The purpose of this study was to evaluate the influence of the stress/strain distribution in buccal bone of an anterior maxillary implant using three bone thicknesses under five different loading angles. Material and Methods. Different testing conditions incorporating three buccal bone thickness, three bone compositions and five loading angles of an anterior maxillary implant were applied in order to investigate resultant stress/strain distribution with finite element analysis. Results. The maximum equivalent stress/strain increased with the decreasing of loading angle relative to the long axis. In addition to loading angle, bone quality and quantity also influenced resultant stress distribution. Conclusions. Dental practitioners should consider combinations of bone composition, diameter and load angulations to predict success or failure for a given implant length and diameter.