

Title: Finite element analysis in orthodontic microscrews with different shapes and diameters

Abstract

The stress analysis provide information that can increase the clinical success rate of orthodontic microscrews. The objective of this study was to quantify and to compare the stress distribution, using finite element analysis (FEA) in microscrews 6 mm long: (a) cylindrical and conical with 1.6 mm diameter, and (b) cylindrical with 1.4 and 1.8 mm diameter. To the finite element analysis, 4 microscREW models were generated in the COSMOSXpress program and a 5 N load was applied normal to the axial axis in the head of the microscrews. The FEA showed a higher concentration of strain near the transmucous profile of both microscrews and, in the 1.4 diameter cylindrical microscREW, the strain was almost twice the strain found in the 1.8 mm diameter microscREW, when submitted to the same load.

Key-words: Dental stress analysis. Finite element analysis. Orthodontic anchorage procedures. Orthodontic appliance design.

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