Dokumenttyp: journal article

Autor(en) des Beitrags: Clason, C; Hinz, AM; Schieferstein, H

Titel des Beitrags: A method for material parameter determination for the human mandible based on simulation and experiment.

Abstract: In cranio-maxillofacial surgery planning and implant design, it is important to know the elastic response of the mandible to load forces as they occur, e.g., in biting. The goal of the present study is to provide a method for a quantitative determination of material parameters for the human jaw bone, whose values can, e.g., be used to devise a prototype plastic model for the mandible. Non-destructive load experiments are performed on a cadaveric mandible using a specially designed test bed. The identical physiological situation is simulated in a computer program. The underlying mathematical model is based on a two component, linear elastic material law. The numerical realization of the model, difficult due to the complex geometry and morphology of the mandible, is via the finite element (FE) method. Combining the validated simulation with the results of the tests, an inverse problem for the determination of Young’s modulus and the Poisson ratio of both cortical and cancellous bone can then be solved.

Zeitschriftentitel / Abkürzung: Comput Methods Biomech Biomed Engin

Jahr: 2004

Band: 7

Heft / Issue: 5

Seiten: 265-76