

Procedure for creating of personalized geometrical models of the human mandible and corresponding implants

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Abstract

The greatest challenge in engineering of human mandible implants lies in its customization for each patient individually, by adapting them to the patients' anatomical, morphological and physiological characteristics. This customization maximizes the efficiency of the patients' health recovery process. The application of anatomically shaped and personalized bone endoprosthesis, fixation plate and scaffold models bring great improvement to the clinical practice in maxillofacial surgery. It ensures that implant meets the biomechanical and dentofacial aesthetic requirements and, ultimately, reduces complications during recovery. In order to create such implants, novel procedure based on personalized models of mandible and its parts, and also plates and scaffold implants is presented in this paper. Design procedures for the creation of the personalized models are based on the application of Method of Anatomical Features, which has been already applied for the creation of geometrical models of human bones. This procedure improves pre-surgical planning, enables better execution of surgical intervention, and as a consequence improves patient recovery processes.

Key word: - mandible implant, fixation plate, scaffold, personalized model, Anatomical Features.

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