BIOMECHANICS OF HUMAN MANDIBLE

Current trends of biomechanics

There are several methods of construction for human mandible, but the most common and safest is using plates and screws. The size of the mandible varies from person to person; therefore, plates and screws are available in different sizes, yet they do not fulfill the surgeon's entire needs, there are a few problems that they pose. This paper presents a general algorithm for making a parametric master model to fit all sizes of lower human jaws. The surgeon will only need to fill in the parameters which describe the features of lower human jaw for a specific patient, and then CAD/CAM Software will automatically create the suitable master model, check stress analysis and create CNC part program required for manufacturing the actual lower human jaw. Several lower human jaws have been created using the proposed approach and satisfactory results were obtained.

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From the early days of man, he has been working on improving all the aspects of his life and living, in order to make him more comfortable. In the medical field, fractures have been a major concern.

To accomplish the goal of surgery, surgical procedures involve some form of patient injury, so it is essential that surgical techniques be as gentle and accurate as possible. The human being has a very complex structure, formed of many parts such as the hands, legs, feet, face and, body. Body parts are in turn made of tissues, muscles, bones and cartilage. While all humans have those parts, each human has his own identity, i.e. all humans have hands and feet, cartilage and bone, but not with the same dimensions and properties, and each is specially designed in a way to fit each human**.**

There are several methods of reconstruction, but the most common and safest is using plates and screws. The size of the mandible varies from person to person; therefore, plates and screws are available in different sizes, yet they do not fulfil the surgeon's needs.

The aim of this paper was to design a new plating system that would solve three of the main problems of the conventional techniques, which are: size unification, incapability of carrying powder and chip bone, and inflexibility. These problems lead to plate fracture, screw

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- Maxillofacial surgery
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loosening, malunion and nonunion in numerous cases. A new parametric design was developed. The new design also solves the problem of tumor patients where powder and chip bone are used to replace the missing part after the tumor is removed. The U-channel made in the design is useful for that as it will save time and effort during operation.