



Investigation of the Stress Distribution in a Bone Due to Screws Pretensions of the Bone Plate

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Because of the maximum bending moments occur at the middle points of the human femur, fractures of this bone are one of the most frequent bones fractured. The plate and screw internal fixation technique is widely used for the treatment of fractured long bones. The plate and screw internal fixation technique has been improved in recent years and many researches have been done on the calculating stress distribution in a fractured bone by considering the effect of the bone plate. However, the effect of the screws were not considered. The purpose of this paper is calculation of stress distribution and maximum stress in fractured femur due to the bone plate screws pretension as a function of the distance between them. A 3D simplified finite element model of femur, bone plate and screws has been constructed. Then a constant pretension is applied to all of the bone plate screws and the stress distribution is calculated for some different distance between screws. Finally, the optimum distance between bone plate screws is discussed.