

Introduction :-

The frequent involvement of the mandibular angle in facial fractures can be attributed to its thin cross-sectional bone area and the common presence of a third molar. Before the advent of antibiotics, open reduction of mandibular fractures was associated with a high frequency of infection.

Surgical intervention with stable internal fixation is warranted only if it results in good anatomic reduction and provides the appropriate milieu for undisturbed healing.

That is why in vitro biomechanical studies are so important for the development of the clinical management of fractures. Finite element analysis (FEA) is a numerical analysis technique that can determine the displacements, stresses, and strains over an irregular solid body given the complex material behaviour and the loading conditions imposed upon that body.

Aims and Objectives :-

To find the various stress distribution in mandibular angle fractures using different plating techniques. The objective of the study is to compare the stress distribution in bone under occlusal front, occlusal ipsilateral and occlusal contralateral loads. To compare stress distribution along the angle of the mandible by using 2.5mm 2 hole, 4 hole and 6 hole plates. To determine which plating technique is the most ideal one in distributing stresses in the bone so that it will enhance the stability as well as survival rate of the titanium miniplates.

Methodology :-

A three dimensional finite element model of the mandible with four different plating techniques were modelled based on the measurements of a human dentulous mandible using modelling software ‘Solidworks2018’ and was analyzed for stresses produced in the bone following front, ipsilateral and contralateral biting loads of different magnitude using ‘ANSYS 18.2 Workbench’.

Results :-

The results of the study indicated that two plating technique have more favorable stress distribution in bone compared to other plating techniques.

Summary and Conclusion :-

Based on the observations in this study, it was concluded that two plating technique showed more favorable stress distribution compared to other plating techniques and could be considered for use with mandibular angle fractures. However further clinical research is suggested using muscle forces to improve the research.