 DOI: 10.21608/adjalexu.2022.273508

BIOMECHANICAL EVALUATION OF DOUBLE Y-SHAPED TITANIUM MINIPLATE AND DYNAMIC COMPRESSION TITANIUM MINIPLATE AFTER INDUCED MANDIBULAR FRACTURE (AN EXPERIMENTAL STUDY ON DOGS)

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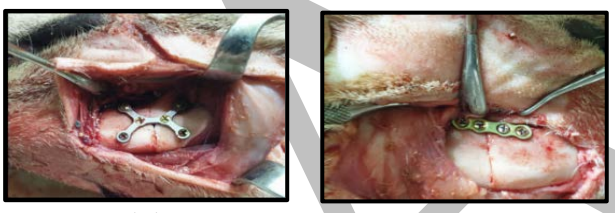
INTRODUCTION

A variety of internal fixation procedures have been examined, with a wide range of problem rates. For this form of fracture fixation, lag screws, reconstruction plates, dynamic compression plates, and locking plates (1,2).

The aim of the study , Comparison of two different types of titanium miniplates Dynamic compression miniplate(DCM) and double-Y miniplate (DYM) in terms of resistance to displacement and stability using an animal model.

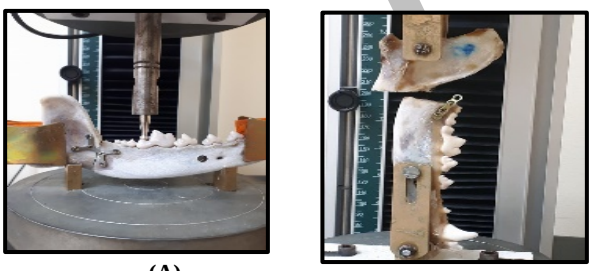
METHODOLOGY

Induced fractures were prepared on each side of the mandible of twelve dogs at the angle region. The sample was divided into two groups with randomization .The first group received dynamic compression titanium miniplate to repair the fracture and the second group received double Y titanium miniplates figure (1).The sacrifice of the dogs was done immediately, and biomechanical evaluation was done by a universal I testing machine using compression and tension forces figure (2).



(A) (B)

Figure (1): ***A)*** *Double Y-shaped miniplate fixation*
B) *Dynamic compression miniplate fixation*



(A) **(B)**

Figure (2):A)*Compression* ***B)*** *Tension*

RESULTS AND DISCUSSION

Compression resistance: In the first group, the average Displacement at 900N was 10.77 ± 0.79 mm. In the second group, the average Displacement at 900N was 4.48 ± 1.35 mm figure (3).

Tension resisteance: In the first group, the average force which caused the failure of miniplate stability was 377.2 ± 37.19 N. In the second group, the average force which caused failure of miniplate stability was 603.7 ± 44.04 N figure (4).

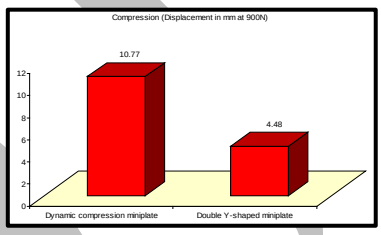


Figure (3): *Shows the difference between (DCM and DYM) regarding Compression (Displacement in mm at 900N)*

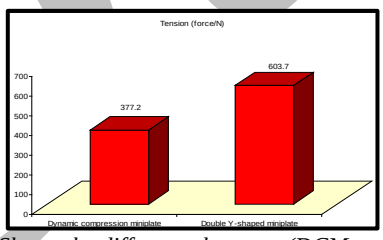


Figure (4): *Shows the difference between (DCM and DYM) regarding Tension (force/N)*

CONCLUSION

Both miniplates provide favorable means of fixation of mandibular fractures in the angle region.

However, fractures fixed with Double-Y shaped titanium miniplates showed greater stability to compressive and tensile forces.

ACKNOWLEDGMENT

First of all, I thank Allah, the most gracious and the most merciful. I would like to extend my sincere gratitude to the people who helped me to complete this thesis. **Ass. Prof. Dr.** Adham Ahmed Elashwah Ass Professor of Oral and Maxillofacial Department, Faculty of Dentistry, Alexandria University, **Ass. Prof. Dr**. Lydia Nabil Melek Ass Professor of oral and maxillofacial Department, Faculty of Dentistry, Alexandria University. **Dr.** Salma Amr AboulGheit Lecturer of Dental Biomaterials Department Faculty of Dentistry Alexandria University

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