سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

سامية محمد مصطفى

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

سامية محمد مصطفى

شبكة المعلومات الجامعية

بعض الوثائق الأصلية تالفة

سامية محمد مصطفى

بالرسالة صفحات لم ترد بالأصل

ASSESSMENT OF LOCALLY MANUFACTURED STAINLESS STEEL SCREW- PLATE SYSTEM IN THE TREATMENT OF MANDIBULAR FRACTURES

(EXPERIMENTAL STUDY)

Thesis

Submitted to the Faculty of Dentistry
Alexandria University
In the Partial Fulfillment
Of the requirements for the

Master Degree In Oral Surgery

By

Ahmed Mohamed Youniss Ibrahim
BDS 1991

Faculty of Dentistry
Alexandria University

1999

SUPERVISORS

Prof. Dr. Ahmad Mamdouh Shaaban

Oral Surgery Department
Faculty of Dentistry
Alexandria University

Dr. Nagy El-Prince Hassan

Ass. Professor Of Oral Surgery
Faculty of Dentistry
Alexandria University

Dr. Fatma El-Didi

Ass. Professor Of Oral Pathology
Faculty of Dentistry
Alexandria University

Prof. Dr.Adel El-Kordi

Properties of Materials Department
Faculty of Engineering
Alexandria University

ACKNOWLEDGEMENT

All thanks should be to Allah.

I wish to express my great thanks and appreciation to ***Prof. Dr. Ahmad Mamdouh Shaaban*** Professor Of Oral Surgery, for his continuous help, faithful advice and sincere guidance. Actually his support was far beyond thanks.

I want to express my great indebtedness and thanks to ***Dr. Nagi El-prince Hasan*** Ass. Professor Of Oral Surgery, for his keen supervision, expert suggestions, continuous guidance and the precious time he devoted to supervise me.

My special thanks and appreciation should be referred to ***Dr. Fatma El-Didi*** Ass. Professor Of Oral Pathology, for her generous help and magnificent cooperation.

I wish to express my great and sincere thanks to ***Prof. Dr. Adel El-Kordi*** Professor Of Properties Of Materials, for his continuous help, kind cooperation and valuable advice.

Words stop short to express my great indebtedness and appreciation to the staff members of Oral Surgery Department, Faculty of Dentistry, Alexandria University, who honored me with the excellent chance to be a student in their department. They did their best to offer me all means of support and paved all the difficulties. They also gifted

me the extract of their experience and skills through close, continuous help and encouragement.

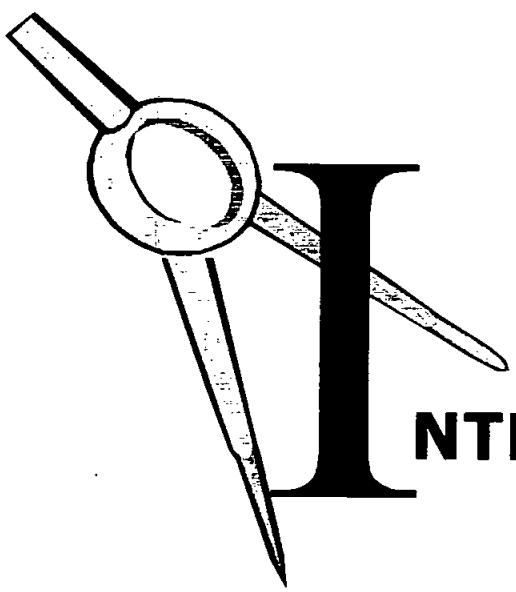
Finally, my entire effort to finish this work refers to the support and understanding of my brothers and sisters to whom I am especially thankful. And finally to the souls of my mother and my father I dedicate my work.

***

بسم الله الرحمن الرحيم

Contents

CHAPTER I



INTRODUCTION

بسم الله الرحمن الرحيم

INTRODUCTION

The methods of treatment of mandibular fractures are dictated by many factors. Internal fixation of mandibular fractures is often required because the occlusion may be inadequate to stabilize the fractured segments, or the patient's medical state may make intermaxillary fixation undesirable. (1)

During the past two decades the operative treatment of mandibular fractures has been influenced and modified by a variety of experimental studies. (2)

Treatment of mandibular fractures by means of rigid fixation appliances " bone plate osteosynthesis " has now become a standard method. Compression osteosynthesis with bone plates gives rigid fixation. This approach is particularly useful for osteosynthesis in the mandible, which is subjected to strong biomechanical forces. (3)

The choice of osteosynthesis material was determined by the calculation of e various bending and torsional forces, anatomical data, and biological tolerance of foreign body material. (2)

To be able to use the technique of rigid fixation it must be understood and accepted that the implants themselves must be

tolerated by the human being initially and overtime. They also must be of a size that is suitable for the intended application and the strength and malleability must also be suitable. (4)

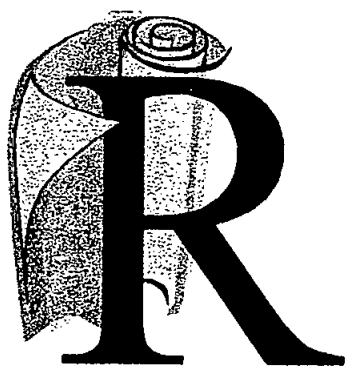
A substance was needed which was biologically well tolerated, adaptable, could be miniaturized, and at the same time would be strong enough to withstand the bending and torsion forces of 60 - 100 Da N. Consequently, an alloy of Chrome, Nickel and Molybdenum was chosen. Several alloys were used for plate construction including Stainless steel, Cobalt - chrome, Nickel - chrome and Titanium alloys. (2)

In treating mandibular fractures, when rigid fixation is indicated, many patients especially those with limited economic situation are usually unable to purchase the plate-screw system required for fixation of the fractures.

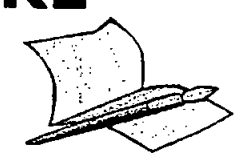
The local manufacture of plates and screws from the stainless steel alloy available here, which is approximately similar to the stainless steel metal from which the costly ready-made plates and screws are manufactured, would greatly reduce the expenses of these plates to make them purchasable for the majority of people.

*****

CHAPTER II



REVIEW OF LITERATURE



بسم الله الرحمن الرحيم

REVIEW OF THE LITERATURE

The mandible is basically a tubular-long bone, which is bent into a blunt V-shape. As with all tubular bone, strength resides in its dense cortical plates. The cortical bone is thicker anteriorly and at the lower border of the mandible while posteriorly the lower border is relatively thin. The central cancellous bone of the body forms a loose network with frequent large bone-free spaces. It occupies a prominent and exposed position and is therefore a common site for the receipt of intentional or unintentional violence. (5)

The mandible is the second most frequently fractured bone of the face (coming after the nasal bones) and the tenth most frequently fractured bone in the body. (6)

The mandible is composed of the body, which is a horseshoe shaped bone, and two broad flattened ascending rami. In the adult, the mandible is composed of outer and inner compact cortical plates with thick medullary bone in between. The rami mainly consist of an outer and inner compact cortical plates separated by a thin layer of cancellous bone, and in many cases this cancellous bone layer is not very prominent. The junction between the thicken body and the thin ramus constitutes a line of structural weakness where fracture could occur. (7)

The mandible exceeds the other bones of the facial skeleton in size and structure. It consists of a body, which