Minimal invasive Plate Osteosynthesis in treatment of fracture Humerus

Essay submitted for fulfilment of the requirements for the Master degree in Orthopaedic Surgery

By

Dr.Hany Ahmed Elsayed Ahmed
M.B.B.Ch

Under supervision of

Prof. Dr. Hazem Abd El Azeem

Prof. of orthopaedic surgery
Cairo University

Prof. Dr. Ahmed Ahmed Morrah
Prof. of orthopaedic surgery
Cairo University

Dr. Ashraf Nihad Moharram
Assist. Prof. of orthopaedic surgery
Cairo University

Cairo University 2009

ABSTRACT

The development of major wound and soft tissue complications with long bone fracture arouse the idea of minimally invasive methods in management of these fractures. These methods improve the outcome and reduce the incidence of wound complications. This essay presents and discusses the recent trends of minimal invasive techniques in treatment of fractures of the humerus.

***Key Words*:** Humerus—minimally invasive- internal fixation – plate

ACKNOWLEDGMENT

I am deeply grateful for the many people who have encouraged me and have shown me support throughout this research project, my graduate studies and my life. First and foremost, I would like to thank God, for I owe my very life to him. Lord, without you in my life, I would certainly be nothing. Thank you for your love and grace.

I am extremely grateful to my supervisors. I would like to express my sincere thanks and deep gratitude and respect to ***Prof. Dr.Hazem Abd El Azeem***, Professor of Orthopaedic Surgery, Faculty of Medicine, Cairo University, for his great support, kind guidance, meticulous revision and encouragement in performing this work.

I also wish to express my extreme appreciation and gratitude to ***Prof. Dr.Ahmed Ahmed Morrah*** , Professor of Orthopaedic Surgery , Faculty of Medicine, Cairo University, for his faithful supervision, constructive guidance and real interest in the progress of this work.

I am also very thankful to ***Dr. Ashraf Nihad Moharram***, Assistant Professor of Orthopaedic surgery, Faculty of Medicine, Cairo University, who contributed to this work, and provided me with the technical support I needed much.

I owe countless thanks to my family, as they have supported me throughout life. Mom and dad, thank you for teaching me to always strive for excellence. I hope it shows through in this project. I dedicate this project to you. It is my hope that I have been a good example for you as you strive for excellence throughout your lives.

At last but not least, I would like to express my profound gratitude and love to my seniors and colleagues.

CONTENTS

LIST OF FIGURES

LIST OF TABLE

LIST OF ABBREVIATIONS

AO: Arbeitsgemeinschaft fur Osteosynthesefragen
DCP: dynamic compression plate
DCS: dynamic condylar screw.
K-wires: kirschner wires
LC: Locked Plates
LCP: less contact plat
LISS: Less Invasive Stabilization System.
MIPO: minimally invasive plate Osteosynthesis
ORIF: open reduction and internal fixation.
PC-Fix : percutaneous fixation
NBC-PH: Non-Contact-Bridging Plate to the Proximal Humerus.

Introduction

Most humeral shaft fractures can be successfully treated by nonoperative methods. The indications for operative treatment include unacceptable alignment after closed reduction, multiple injuries, radial nerve palsy after manipulation, bilateral humeral fractures and open fractures. Compression plate fixation, which is a widely accepted operative method gives a high union rate and allows early active motion of the joints, however, is technically demanding and requires extensive surgical dissection with risk of injury to the radial nerve. [1]

An interlocking intramedullary nail has been reported to produce satisfactory results with less soft tissue injury, relatively percutaneous insertion as well as biomechanical advantages; however its entry may lead to rotator cuff tear and proximal the nail may creat shoulder impingement and decrease shoulder abduction and distally may lead to problem of elbow extention.[2]

Introduction

As a result of technical advancement, minimally invasive plate Osteosynthesis (MIPO) has gained popularity in recent years with satisfactory clinical outcomes. The plate is inserted by a percutaneous approach with separate proximal and distal incisions. This method requires less soft tissue disruption and preserves the fracture haematoma and blood supply to the bone fragments, although percutaneous plate insertion in humeral shaft fractures seems to be a dangerous procedure regarding radial nerve injury.[3,4]

Four conventional surgical approaches to the humeral shaft have been described: posterior, anterolateral, anterior and anteromedial. Open plate fixation has generally utilized two approaches: anterolateral and posterior.

The anterolateral approach is suitable for proximal and middle third fractures, whereas distal third fractures are best treated using the posterior approach. The anteromedial approach is less useful because of intervening neurovascular structures. The anterior approach is rarely used. However,the radial nerve does not cross the anterior aspect of the humerus, hence the anterior approach to the humerus carries the least risk of injury to the radial nerve.[5,6]

Introduction

Osteosynthetic procedures with new implants designed for better implant anchorage even in osteopenic/ osteoporotic bone were developed. There are two different design philosophies within the latest developed implants. One design group aims to provide maximum stability, referred to as “rigids”. Rigid implants perform ideally in patients with good bone quality. The other promotes semi-rigid (“elastic”) fixation. These semi-rigid implants are designed to allow some motion and thereby decrease the forces acting upon the bone metal interface during strain. On decreased bone quality, a rigid implant might fail due to insufficiency of the bone metal interface, whereas the semi-rigid implant might reduce the strain on the interface by absorbing a part of the energy (motion) and therefore maintaining the interface intact. On the other hand, if throughout the healing phase, the fracture is disturbed by motion at the fracture site nonunion might be observed more often.[7,8]

Introduction

Introduction

Anatomy