بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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Minimally Invasive Plating Osteosynthesis Technique versus Anterolateral Approach for Fixation of Humeral Mid-Shaft Fractures (Systematic Review - Meta-Anaylsis)

Submitted for Partial Fulfillment of Master degree in ***Orthopaedic Surgery***

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قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
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List of Abbreviations

Abb.	Full term
AO/OTA	Orthopedic Trauma Association
ORPF	Open Reduction and Plate Fixation
DCP	Dynamic Compression Plate
LCP	Locking Compression Plate
LC-DCP	Low Contact Dynamic Compression Plate
N/A	Not Available
UCLA score	University of California Los Angeles score
MEPI score	Mayo Elbow Performance Index score
ROM	Range Of Motion
ASES score	American Shoulder and Elbow Surgeons score
MIPO	Minimal invasive plate osteosynthesis
CI	Confidence interval
ORIF	*Open reduction internal fixation*

INTRODUCTION

The humeral diaphyseal fracture involves the segment of bone between the inferior limit of the insertion of pectoralis major and the upper limit of the insertion of the muscles at the medial and lateral epicondyle [(1)].

Fractures of the humerus account for approximately 5-7% of all body fractures. The relative incidence of proximal, diaphyseal and distal humeral fractures are 40, 20 and 40% respectively. Fractures of the humerus usually result from falls or direct trauma. The managment of diaphyseal humeral fractures has also been a lively topic of debate [(2)].

Radial nerve palsy is presented initially in 10–20% of the fractured patients and typically manifests itself as paresthesia or paralysis of wrist dorsiflexion, finger extension at the metacarpophalangeal joints, thumb extension and abduction and hypothesia of the dorsal side of the first inter-digital corner. Radial nerve involvement must be pointed out to the patient and/or family, and recorded in the observations. It plays an important role in the treatment choice and follow-up. The fracture is typically located in the middle third or at the junction of the middle and distal third and is highly displaced. This is determined more on the basis of the energy of the trauma than based on the radiographs, because the fracture can be realigned during transport or when the radiographs are performed [(3)] .

While closed humeral midshaft fractures can be managed non-operatively with reported union rates as high as 94%, the operative managment of these fractures has become popular over the last two decades. In particular, non-operatively treated transverse and short oblique midshaft fractures have been associated with delayed union in reference works [(2)].

Various methods are used to treat mid-distal third humeral shaft fractures. Most of the fractures can be effectively treated conservatively. Operative intervention is indicated in special circumstances including (1) failure of closed reduction, (2) intra-articular extension of fractures, (3) neurovascular compromises, (4) associated ipsilateral forearm and elbow fractures, (5) segmental fractures, (6) pathological fractures, (7) open fractures, (8) fractures in polytraumatised patients, (9) bilateral humeral shaft fractures, (10) periprosthetic fractures and (11) transverse or short oblique fractures. These fractures can be surgically treated by either using a dynamic compression plate or intramedullary nails. Although controversy exists over which is the better technique, most authors believe that open reduction and internal fixation with a dynamic compression plate is a more reliable method. The advantages include anatomical reduction of fractures and less interference to elbow and shoulder function. The major disadvantages of this technique, however, are extensive soft tissue stripping and disruption of periosteal blood supply, which increase the risk of nonunion and iatrogenic radial nerve palsies. It has been reported that humeral shaft fractures can be successfully treated

with minimally invasive plating osteosynthesis (MIPO). This technique has advantages of less soft tissue dissection and avoids the need to expose the radial nerve; thus, there is also low risk of iatrogenic radial nerve palsies. These advantages appear to indicate that MIPO is superior to conventional plating osteosynthesis. However, there is no large series that reports advantages and disadvantages of MIPO compared to conventional plating osteosynthesis technique [(4)].

For the majority of humeral shaft fractures, non-operative management is the treatment of choice, and satisfactory outcomes are typically achieved. When operative treatment is indicated, plating and intramedullary nailing are the two main treatment modalities of choice [(5)].

There are several surgical approaches to the humeral shaft, and although they have their own unique advantages and disadvantages, the choice is often guided by fracture location: mid-shaft to more distal fractures are typically approached posteriorly or laterally, whereas the anterior and anterolateral approaches are favored for proximal one-third to mid-shaft fractures. One of the main advantages of an anterolateral approach is the possibility for an Extensile exposure, as the approach can be extended both proximally and distally. The anterolateral approach has also been shown to result in lower rates of iatrogenic radial nerve palsy (4%) compared with lateral (20%) and posterior approaches (11%) while also allowing for supine positioning in polytrauma patients [(6)].

Aim of the Work

The aim of this study is to introduce a systematic review\meta-anaylsis on minimally invasive plate osteosynthesis for humeral shaft fractures showing its indications, advantages, complications and discussing its results in comparison to open reduction and internal fixation (anterolateral approach).