Safaa Mahmoud

بسم اللّه الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني

Safaa Mahmoud

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

Dynamic Locked Plating of Distal Femur Fractures

A Systematic Review and Meta- Analysis

For Partial fulfillment of Master Degree in Orthopedic Surgery

By

Amr Mostafa Ismaeil Basuony

M.B., B.Ch., Faculty of Medicine, Ain-shams University

Under supervision of

Prof. Mootaz Fouad Thakeb

Professor of Orthopedic Surgery
Faculty of Medicine - Ain Shams University

Dr. Shady Samir Elbeshry

Assistant Professor of Orthopedic Surgery
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
2019

سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to **ALLAH**, *the Most Kind and Most Merciful.*

I'd like to express my respectful thanks and profound gratitude to **Prof. Mootaz Fouad Thakeb,** *Professor of Orthopedic Surgery Faculty of Medicine - Ain Shams University for his keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

I am also delighted to express my deepest gratitude and thanks to **Dr. Shady Samir Elbeshry,** *Assistant Professor of Orthopedic Surgery Faculty of Medicine - Ain Shams University, for his kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

Amr Mostafa Ismaeil Basuony

List of Contents

List of Tables

List of Figures

List of Figures Cont...

List of Abbreviations

Abb.	Full term

DLP..... *Dynamic locked plate*

FCL..... *Far cortical locking*

LCP..... *Locking compression plate*

LP..... *Locked plating*

MIPO ..... *Minimally invasive plate osteosynthesis*

OTA..... *Orthopaedic Trauma Association*

Abstract

Background: Distal femur fractures account for less than 1% of all fractures and 3%–6% of all femur fractures. Epidemiological studies indicate 2 primary distributions of patients: elderly individuals with low energy mechanisms such as a fall from standing, and younger patients with high-energy mechanisms such as motor vehicle accidents. Fixation of the distal femur fracture with lateral locked plate had a nonunion rate between 0 to 32%. The concept of "Dynamic" Locked Plates, has been proposed to decrease construct stiffness & improve callus formation**.**

Objective: A systematic review and meta-analysis of literature to assess the outcomes of dynamic locked plate of distal femora fractures.

Data Sources: Medline databases (PubMed, Medscape, ScienceDirect. EMF-Portal) and all materials available in the Internet till 2018.

Data Extraction: If the studies did not fulfill the inclusion criteria, they were excluded. Study quality assessment included whether ethical approval was gained, eligibility criteria specified, appropriate controls, and adequate information and defined assessment measures.

Conclusion: Our systematic review and meta-analysis showed different method of distal femur locked plate dynamyzation. DLP of distal femur increased interfragmentery micro motion, decrease construct stiffness and improve healing & union rate of distal femur fractures. Finally it should be noticed that the orthopedic surgeon should be qualified to utilize which of these techniques & the choice depends on the preoperative planning & method of fixation available which leads to fracture union on time without complications.

Keywords: Dynamic locked plate, distal femur fractures

INTRODUCTION

Distal femur fractures account for less than 1% of all fractures and 3%–6% of all femur fractures. Epidemiological studies indicate 2 primary distributions of patients: elderly individuals with low energy mechanisms such as a fall from standing, and younger patients with high-energy mechanisms such as motor vehicle accidents. [(1)]

Simple metaphyseal fractures that are amenable to direct reduction with absolute stability do sometimes occur; however, due to the increasing number of elderly patients with osteoporosis and the higher energy injuries that younger patients are now surviving, distal femur fractures are often associated with highly comminuted metaphyseal segments that are more amenable to indirect reduction techniques and relative stability.[(1)]

Fracture Healing is greatly influenced by the fixation method. Classic compression plate fixation requires the creation of a rigid plate/bone construct which involves soft-tissue stripping and devitalization of the underlying bone, this may lead to inhibited callus formation. Hence, the concept of plating with minimal soft tissue stripping using locking plates has been promoted.[(1)]

Locking plates allows for stable bridge plating in cases with short end segments, thus their use is becoming more common for fixing distal femur fractures. [2]

Non-locking plates have fallen out of favor due to the increased incidence of late varus displacement. Fixed-angle plates have proven to be more effective in resisting the high forces in multiple planes about the distal femur. Anatomically pre-contoured locking plates are popular due to improved fixation in osteoporotic bone and highly complex articular fractures compared to blade or dynamic condylar plate. [1]

Angle stable locked plating has become the standard treatment for most difficult comminuted fractures of the distal femur.[3]

Fixation of the distal femur fracture with lateral locked plate had a nonunion rate between 0 to 32% [13].

The high stiffness associated with locked constructs may not provide the amount of motion needed to obtain adequate callus formation for physiologic healing. Delayed union, nonunion, implant failure, and deficient callus have all been linked to locked plating, likely due to the increased stiffness provided by the construct.[5]

The concept of "Dynamic" Locked Plates, has been proposed to decrease construct stiffness & improve callus formation. [2]

Classification of distal femur fracture:

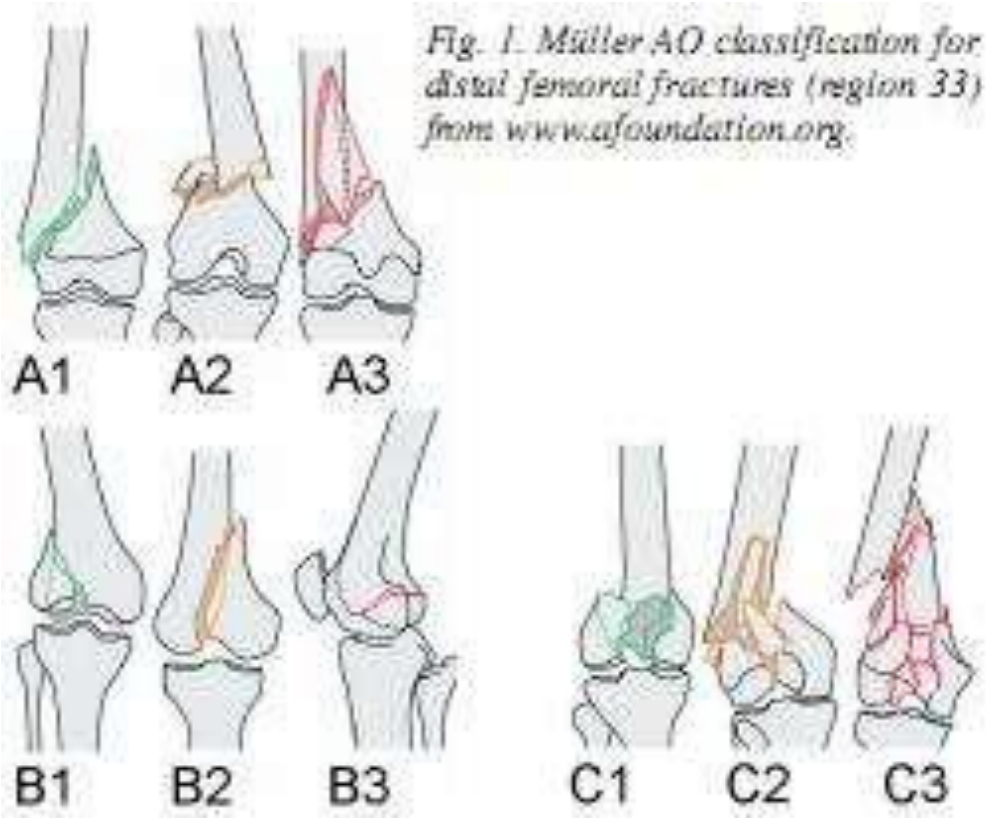

Fig. 1. Müller AO classification for distal femoral fractures (region 33) from www.afoundation.org.

Figure (1): AO Classification. *(6)*

Aim of the Work

A systematic review and meta-analysis of literature to assess the outcomes of dynamic locked plate of distal femora fractures.