Treatment of Bicondylar Tibial Plateau Fractures by single lateral locked Plate

Thesis

Submitted for partial fulfilment of requirement of M.D

Degree in Orthopedic surgery

By

Ahmed Hasan El.Bana Ibrahim

M.B. B.ch.

Supervised by

Prof. Dr. Hassan Elgamal

Professor of Orthopedic surgery

Faculty of Medicine-Cairo University

Prof. Dr. Sherif Abdelatif Othman

Associate Professor of Orthopedic surgery

Faculty of Medicine-Cairo University

Dr. Wessam Gamal Abu Senna

Lecturer of Orthopedic surgery

Faculty of Medicine-Cairo University

Faculty of Medicine

Cairo University

2014

Table Of Content

بسم الله
الرحمن الرحيم

Acknowledgment

*First of all I would like to thank "**Allah**" for helping me to finish this work.*

*I would like to express my deepest gratitude and appreciation to **Prof. Dr. Hassan Elgamal**, Professor of Orthopaedic surgery, Cairo University, for his supervision, encouragement and fruitful remarks that are inscribed within this work. His experience and wide knowledge were helpful in guiding me throughout the steps of this work.*

*I am extremely grateful to **A. Prof. Dr. Sherif Abdelatif Othman**, Associate Professor of Orthopaedic surgery, Cairo University, for his supervision and reliable advice throughout this work.*

*I also feel extremely grateful to **Dr. Wessam Gamal Abu Senna**, lecturer of Orthopaedic surgery, Cairo University, for his continuous encouragement, supervision and sincere guidance throughout this work.*

I would like also to thank all my professors and my colleagues for their great help and support.

Finally I wish to express my thanks to my wife Mrs. Hebatallh Refaat Zayed, my lovely daughter Talia and my family for their love, care and continuous encouragement and patience throughout this work and my life.

*I hope from **"Allah"** to accept and keep this work for his own face.*

Ahmed Hasan El.Bana

ABSTRACT

Introduction: Bicondylar tibial plateau fractures need surgical treatment to achieve good clinical results. The locking plate combines the technical advantages of an angular stable plate with those of the modern biological plating technique.

Hypothesis*:* Bicondylar Tibial Plateau Fractures can be effectively managed using a single lateral locking plate.

Materials and methods: Between May 2012 and November 2013, 20 patients with a mean age of 38 years (Range from 24-57 years) with bicondylar tibial plateau fractures with or without metaphyseal extension. Patients were diagnosed clinically, checked with standard X-rays, CT was done for all cases. Patients were treated by single lateral anatomically contoured locked plate through LISS or Polyaxial locking plate systems with or without additional screws from medial side. Radiological evaluation and functional assessment was done according to the Rasmussen Knee score. Patients were followed-up for an average of 12 months.

Results: Union was achieved in all patients with a mean knee range of motion of 1.5°-130° (range 0°-10° for extension, range 100°-135° for flexion). The mean Functional Rasmussen Knee score at last follow-up was 94.7% ranged between (83.3%–100%). The mean Anatomical Rasmussen Knee score at last follow-up was 92.2% ranged between (77.7%–100%). Mean Functional Rasmussen Knee score of patients had (Schatzker V fractures) was 96%, however it was 82.5% in those had (Schatzker VI fractures). Mean Anatomical Rasmussen Knee score of patients had (Schatzker V fractures) was 93.8%, however it was 90.3% in those had (Schatzker VI fractures). Of the 20 cases, 2 had wound related problems, 1 case suffered from preoperative proneal nerve palsy, 1 cases had preoperative compartment syndrome, 1 case had fixation failure and one patient suffered from hardware irritation.

Conclusion: Surgical treatment of bicondylar tibial plateau fractures with the single lateral locked plate that was evaluated in our study can lead to a good functional and anatomical outcome and considered an effective system for providing fracture stabilization provided that the correct surgical technique is used. Awareness of potential hardware complications is essential.

Keywords: Tibial plateau fracture, Locked plate, LISS, Polyaxial locking plate.

List of Figures

List of Tables

List of Abbreviations

AO-OTA	**:**	Arbeitsgemeinschaft fü Osteosynthesefragen-Orthopaedic Trauma Association
CT	**:**	Computed Tomography
MRI	**:**	Magnetic Resonance Imaging
MIPO	**:**	Minimal Invasive Plate Osteosynthesis / Minimal Invasive Percutaneus Osteosynthesis
Fig.	**:**	Figure
ACL	**:**	Anterior Cruciate Ligament
PCL	**:**	Posterior Cruciate Ligament
CPM	**:**	Continuos Passive Motion
MCL	**:**	Medial Collateral Ligament
LCL	**:**	Lateral Collateral Ligament
PFL	**:**	Popliteal Femoral Ligament
PT	**:**	Popliteus tendon
ATLS	**:**	Advanced Trauma Life Support
API	**:**	Arterial Pressure Index
AP	**:**	Anterior-posterior
3D CT	**:**	3 Dimension Computed Tomography
ORIF	**:**	Open reduction and internal fixation
SHF	**:**	Sheffield Hybrid Fixator
LISS	**:**	Less Invasive Stabilization System
ROM	**:**	Range Of Motion
NWB	**:**	Non Weight Bearing
PWB	**:**	Partial Weight Bearing
FWB	**:**	Full Weight Bearing
MVA	**:**	Motor Vehicle Accident
CS	**:**	Culture & Sensitivity
ICU	**:**	Intensive Care Unit

Introduction

The tibial plateau refers to the proximal end of the tibia including the metaphyseal and epiphyseal regions as well as the articular surfaces made up of hyaline cartilage. By Arbeitsgemeinschaft fü Osteosynthesefragen/Orthopaedic Trauma Association (AO-OTA) classification, the tibial plateau includes the metaphysis to a distal distance equal to the width of the proximal tibia at the joint line. Tibial plateau fractures constitute 1% of all fractures and 8% of fractures in the elderly. [(1)]

The injury patterns to the tibial plateau depend on the magnitude of forces, the quality of the bone and the age. It is generally believed that the relatively increased strength of the medial tibial condyle structure, and the normal valgus alignment of the lower limb are responsible for the higher incidence of lateral tibial condylar fractures secondary to low-energy forces. Similar amount of forces cause split or wedge fractures in the young population, or depression fractures in the osteoporotic bone of the elders. [(2)]

Currently, there are two classifications for tibial plateau fractures in use, the AO/OTA and the one of Schatzker's. The AO/OTA classification although complex, offers a more precise description of the fracture pattern, while Schatzker's classification is more reproducible and reliable. Other classifications like Hohl , Hohl and Moore are not commonly used. [(3)]

A thorough history should be obtained, including determination of the mechanism of injury and the patient’s overall medical status, and functional demands. Physical examination is necessary to detect concomitant ligamentous injuries, neurovascular injuries, and other injuries. Anteroposterior, lateral, and oblique radiographs and CT scans are necessary to evaluate these fractures. The exact role of MRI in evaluating patients with tibial plateau fractures is still evolving. [(4)]