

# **Management of High Energy Proximal Tibial Fractures by Ilizarov External Fixator**

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Orthopedic Surgery

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

”إِنْ أُرِيدُ إِلَّا الْإِصْلَاحَ مَا اسْتَطَعْتُ وَمَا

تَوْفِيقِي إِلَّا بِاللَّهِ عَلَيْهِ تَوَكَّلْتُ وَإِلَيْهِ أُنِيبُ.“

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*Khaled Mohammed El Sisy*

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# List of Abbreviations

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<b>Fig.</b>	Figure
<b>ORIF</b>	Open Reduction and Internal Fixation
<b>SC</b>	Subcutaneous
<b>LPFA</b>	Lateral Proximal Femoral Angle
<b>mLDFA</b>	Mechanical Lateral Distal Femoral angle
<b>JLCA</b>	Joint Line Congruity Angle
<b>MPTA</b>	Medial Proximal Tibia Angle
<b>LDTA</b>	Lateral Distal Tibia Angle
<b>MNSA</b>	Medial Neck Shaft Angle
<b>MPFA</b>	Medial Proximal Femoral Angle
<b>aLDFA</b>	Anatomical Lateral Distal Femoral Angle
<b>PPFA</b>	Posterior Proximal Femoral Angle
<b>ANSA</b>	Anterior Neck Shaft Angle
<b>PDFA</b>	Posterior Distal Femoral Angle
<b>PPTA</b>	Posterior Proximal Tibia Angle
<b>ADTA</b>	Anterior Distal Tibia Angle
<b>A/P</b>	Anterior/Posterior
<b>ACL</b>	Anterior Cruciate Ligament
<b>MCL</b>	Medial Collateral Ligament
<b>LCL</b>	Lateral Collateral Ligament
<b>PCL</b>	Posterior Cruciate Ligament
<b>RTA</b>	Road Traffic Accident
<b>ATLS</b>	Advanced Trauma Life Support
<b>AP</b>	anteroposterior
<b>AO</b>	Association of Osteosynthesis
<b>ASIF</b>	Association and Society of Internal Fixation
<b>OTA</b>	Orthopedic Trauma Association
<b>ROM</b>	Range of Motion
<b>MIO</b>	Minimal Invasive Osteosynthesis
<b>LISS</b>	Less Invasive Stabilization System

## List of abbreviations

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<b>DVT</b>	Deep Venous Thrombosis
<b>IM</b>	Intramedullary
<b>IV</b>	Intravenous
<b>OA</b>	Osteoarthritis
<b>TKR</b>	Total Knee Replacement
<b>MCA</b>	Motor Car Accident
<b>ER</b>	Emergency Room
<b>OPD</b>	Out Patient Department
<b>PT</b>	Prothrombin Time
<b>PTT</b>	Partial Prothrombin Time
<b>INR</b>	International Normalized Ratio
<b>OR</b>	Operative Room
<b>IU</b>	International Unit
<b>ASAMI</b>	Association for the Study and Application of the Method of Ilizarov
<b>SPSS</b>	Statistical Program for Social Science
<b>SD</b>	standard deviation

# Abstract

**Background:** Despite the evolution of surgical techniques and implants, high energy proximal tibia fractures remain a challenging problem. The goals of treatment are to obtain a well-aligned stable joint with a painless functional range of motion and prevention of posttraumatic arthritis. Indirect reduction techniques and other soft tissue preservation methods safeguard the vascularity and emphasize restoring both joint congruity and the mechanical axis of the limb. **Aim of the work:** is to evaluate the use of circular hybrid Ilizarov external fixator with or without minimal internal fixation in the management of high energy proximal tibial fractures. **Methods:** between March 2011 and March 2013 we treated 30 patients with high energy proximal tibia fractures including extra- and intra- articular fractures using the Ilizarov fixator, all patients were a result of high energy trauma. There were 23 male patients and 7 female patients, 14 were Right side while 16 were Left side, mean age was 36.2 years, there were 17 cases with open fractures and 13 patients had closed fractures, 21 patients had intraarticular fractures and 9 patients had extraarticular fractures. **Results:** all patients united in a mean time of 19 weeks, we had 9 patients with few complications that have been well treated. According to ASAMI scoring system we had excellent results in 66.7%, good results in 26.7%, fair results in 6.6% and no poor results. **Conclusion:** Ilizarov external fixation is a safe and effective treatment option for high energy proximal tibia fractures with good functional results.

**Keywords:** Ilizarov, circular external fixator, high energy proximal tibia fractures, Schatzker types V and VI.

# ***Introduction***

## Introduction

The knee joint is one of three major weight-bearing joints in the lower extremity. Fractures that involve the proximal tibia affect knee function and stability. These fractures can either be intra-articular (tibial plateau) or extra-articular (proximal fourth). Generally, these injuries fall into two broad categories: low-energy and high-energy fractures. The spectrum of associated injuries, potential complications and outcomes varies with fracture pattern.<sup>(1)</sup>

There are many classification schemes to describe these injuries, with no clear consensus on indications for surgical treatment of certain fracture patterns. More attention has been paid to the condition of the soft tissue envelope before surgical intervention.<sup>(1)</sup>

Complex fractures of the proximal tibia are difficult to treat and represent one of the most challenging problems in orthopedic surgery as they entail articular depression, condylar displacement, dissociation of comminuted metaphysis, and usually associated with soft tissue injuries.<sup>(2)</sup>

The treatment goals are to anatomically reconstruct the proximal tibial articular surface, fix metadiaphyseal comminution, and restore limb axial alignment to allow early knee mobilization and weight bearing and minimize further morbidity to an already traumatized soft tissue envelope.<sup>(3)</sup>

Over the years, many treatment modalities have been proposed for these complex fractures. Indirect reduction and external fixation have been advocated by many authors to improve the results and to minimize the risk of serious complications associated with the extensile approaches of ORIF.<sup>(3)</sup>

The Ilizarov method combined with minimal internal fixation enables excellent to good results in most cases of complex proximal tibia fractures when applied with good indications, planning, and surgical experience. <sup>(2)</sup>