



## TO EVALUATE THE FUNCTIONAL OUTCOMES OF MINIMALLY INVASIVE PERCUTANEOUS PLATE OSTEOSYNTHESIS IN PROXIMAL TIBIA FRACTURES

### Orthopaedics

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### ABSTRACT

**Introduction:** Body weight is transferred through the knee joint and leg by the proximal tibia. It plays a vital role in the knee joint function and stability. There is a wide spectrum of severity associated with fractures of the proximal tibia, including stable, Un-displaced fractures with minor soft tissue damage to highly comminuted unstable fractures with severe soft tissue involvement and are generally classified into high energy fractures and low energy fractures. **Aim & Objectives:** To evaluate the functional outcome of Minimally invasive percutaneous plate osteosynthesis in Proximal Tibia fractures according to Modified Rasmussen's Score. **Material & Methods:** The study was conducted at the Department of Orthopaedic Muzaffarnagar Medical College & Hospital, Muzaffarnagar during 2020-2022 period. A total of 30 patients were admitted and Minimally invasive percutaneous plate osteosynthesis in Proximal Tibia fractures using Locking compression plates was done. All patients were followed up for a minimum of 6 months and outcome assessed with Modified Rasmussen's Score. **Result:** On evaluation according to Modified Rasmussen's Score our results were as follows – Out of 30 patients 14(46.7%) had excellent, 16(53.3%) had good result. **Conclusion:** We conclude that MIPPO is a better and effective method for achieving good to excellent results providing good range of motion and early return to function in the treatment of high energy tibial plateau fractures.

### KEYWORDS

#### INTRODUCTION:

Body weight is transferred through the knee joint and leg by the proximal tibia. It plays a vital role in the knee joint function and stability.<sup>[1]</sup> There is a wide spectrum of severity associated with fractures of the proximal tibia, including stable, Un-displaced fractures with minor soft tissue damage to highly comminuted unstable fractures with severe soft tissue involvement and are generally classified into high energy fractures and low energy fractures.<sup>[2]</sup> The main reason for these fractures is its subcutaneous location of the anteromedial surface of the tibia. The majority of tibial plateau fractures— originally known as car bumper fractures, occur due to fall from height and high-velocity road traffic accidents (RTA).<sup>[3]</sup> The MIPPO technique can be used to achieve biological fixation, due to a greater understanding of fracture healing biology and biomechanics. When treating split unicompartmental fractures, isolated undisplaced fractures, and old bone with osteoporosis, percutaneous fixation is the most beneficial.<sup>[4]</sup>

#### AIM & OBJECTIVES:

To evaluate the functional outcome of Minimally invasive percutaneous plate osteosynthesis in Proximal Tibia fractures according to Modified Rasmussen's Score.

#### MATERIAL & METHODS:

The study was conducted at the Department of Orthopaedic Muzaffarnagar Medical College & Hospital, Muzaffarnagar during 2020-2022 period.

#### Inclusion Criteria:

age group 17-65 years, patients fit for surgery, patients giving consent for surgery.

#### Exclusion Criteria:

Skeletally immature patients, fracture associated with neurovascular injuries, open & pathological fracture. Patients was called up at 3 weeks, 6 weeks, 12 weeks and 6 months. At each follow up visit, progress of the patients was recorded in accordance with Modified Rasmussen's Score.

#### RESULTS:

Thirty cases of proximal tibia fracture were included in our study after fulfilling inclusion criteria.

#### Graph 1: Pain distribution

PAIN	NO. OF PATIENTS	PERCENTAGE
None	16	53
Occasional	12	40
Stabbing pain in certain position	2	7

Constant pain after activity	0	0
Significant rest pain	0	0
Total	30	100%

No pain is most common in 53%, followed by occasional pain in 40%.

Pain	Points
None	6
Occasional	5
Stabbing pain in certain positions	3
Constant pain after activity	-3
Significant rest pain	-3
Walking capacity	
Normal walking capacity for age	6
Walking outdoors (<1 h)	5
Walking outdoors (15 min-1 h)	3
Walking outdoors (<15 min)	1
Walking indoors only	0
Wheelchair/bedridden	-3
Knee extension	
Normal	4
Lack of extension (<10°)	2
Lack of extension (>10°)	0
Lack of extension (>20°)	-2
Total range of motion	
Full	6
At least 120°	5
At least 90°	3
At least 60°	1
<60°	-3
Stability	
Normal stability in extension and 20° flexion	6
Abnormal stability in 20° flexion	4
Instability in extension (<10°)	2
Instability in extension (>10°)	0
Power of quadriceps	
Grade 5	2
Grade 3-4	1
Grade <3	2
Maximum score	30
Excellent	28-30
Good	24-27
Fair	20-23
Poor	<20

#### Graph 2: Walking Capacity

WALKINGCAPACITY	NO. OF PATIENTS	PERCENTAGE
Normal walking capacity for age	14	46
Walkingoutdoors more than one hour	15	50
Walkingoutdoor 15 mins to 1 hour	1	4
Walkingoutdoor <15 mins	0	0
Walkingindoor only	0	0
TOTAL	30	100

Walking outdoor more than 1 hour is most common in 50%

#### Graph 3: Knee Extension

Knee Extension Normal	NO. OF PATIENTS	PERCENTAGE
	24	80
Lack of extension < 10 degrees	6	20
Lack of extension > 10 degrees	0	0
Lack of extension > 20 degrees	0	0
TOTAL	30	100

Knee extension was normal in 80%

#### Graph 4: Total Range of Motion

TOTALRANGE OF MOTION FULL	NO. OF PATIENTS	PERCENTAGE
	17	57
ATLEAST 120 DEGREES	11	37
ATLEAST 90 DEGREES	2	6
ATLEAST 60 DEGREES	0	0
< 60 DEGREES	0	0
TOTAL	30	100

Full total range of motion was maximum in 57%

**Graph 5: Stability**

STABILITY NORMAL STABILITYIN EXTENSION AND 20 DEGREES FLEXION	NO. OF PATIENTS	PERCENTAGE
	25	83
ABNORMAL INSTABILITYIN 20 DEGREES FLEXION	5	17
INSTABILITYIN EXTENSION < 10 DEGREES	0	0
INSTABILITYIN EXTENSION > 10 DEGREES	0	0
TOTAL	30	100

Normal stability in extension & 20 degrees flexion was most common in 83%

**Graph 6: Power of Quadriceps**

POWER OF QUADRICEPS Grade 5	NO. OF PATIENTS	PERCENTAGE
	28	93
Grade 3-4	2	7
Grade <3	0	0
TOTAL	30	100



**Case**

**DISCUSSION:**

Intraarticular tibial plateau fractures are complex fractures accounting for about 1.2% of all fractures.<sup>[5]</sup> They have a significant morbidity impact on knee stability and function. These fractures are caused by high- velocity trauma and typically come with severe soft-tissue comminution and damage. Restoring joint congruity, limb alignment, and early joint mobilisation are the treatment's objectives.<sup>[6]</sup> It is extremely challenging to obtain stable internal plate fixation without compromising the soft-tissue envelope. Open reduction and internal fixation (ORIF) with plates and screws allows for direct fracture visualisation, reduction, and fixation, although there is a high risk of soft tissue damage, stiffness, and deep infection<sup>[7]</sup> With advancements in the handling of the soft tissue, locking implants have made it possible to adopt a minimally invasive approach for unilateral plating<sup>[8]</sup>. If the proximal third of the tibia is broken with metaphyseal comminution, lateral locking plates offer improved stability. With the use of locking plate, fixation is possible by a single incision, preventing the wound dehiscence, infection, and prolonged immobilisation caused by extensile techniques.<sup>[9]</sup> MIPPO permits percutaneous sub muscle implantation and indirect fracture reduction.<sup>[10]</sup> In our study, we have evaluated the patients using Rasmussen score.

**CONCLUSION:**

Our MIPPO (minimally invasive percutaneous plate osteosynthesis) results are comparable to those reported in the literature. At midterm follow up, there was no significant difference in functional outcome of

our study and other studies - Decreased Surgical Trauma, less duration of surgery and reduced blood loss, The range of knee movement is better, Fracture union occurs early. MIPPO is a better and effective method for achieving good to excellent results providing good range of motion and early return to function in the treatment of high energy tibial plateau fractures.

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