

## A Study of Complications After Minimally Invasive Percutaneous Plate Osteosynthesis (Mippo) Technique In Patients of Tibial Plateau Fracture



### Medical Science

KEYWORDS : MIPPO Technique, Tibial Plateau Fracture , Schatzker's classification.

**RAJESH AMBULGEKAR**

PROF & HOD Dept of ortho SCGMC nanded

**MADHUSUDAN KALE**

PROF Dept of ortho SCGMC nanded

### ABSTRACT

*Introduction: Both conservative and operative treatments have achieved good results for tibial plateau fractures. Aims and Objectives: To study of Complications after Minimally Invasive Percutaneous Plate Osteosynthesis (MIPPO) Technique in patients of Tibial Plateau Fracture*

*Methodology: This is institutional based prospective study which comprises of 50 patients with displaced tibial plateau fracture and were treated between jan 2012 to jun 2013 with minimal invasive percutaneous plate osteosynthesis (MIPPO). Statistical analysis done by Chi-square test. Result: Majority of our patients (68%) were in middle age group i.e. 31-50 years. The ratio between male to female was 2.57:1 in this study superficial infection in form of local stitch abscess developed in two patients, which subsided after local debridement and intravenous antibiotics. Deep infection in form of frank pus from surgical wound developed in one patient with grade I compound injury which subsided after thorough debridement and wound wash in operation theatre after two weeks. One patient with Schatzker's type V fracture and grade I compound injury gone in delayed union due to chronic infection which eventually united on 22nd weeks. Loss of range of motion developed in two patients. Two patients developed deformity out of which one developed varus and another one developed valgus. Two patients developed instability at knee joint and those patients also had extension lag more than 10 degrees*

*Conclusions: Deep infection, delayed union, Loss of range of motion, development of varus or Valgus deformity, instability at knee joint, extension lag more than 10 degrees were some of the common complications observed in our study.*

Introduction: Both conservative and operative treatments have achieved good results for tibial plateau fractures.1, 2 Surgical treatment is recommended for fractures with >5 mm displacement or >5° varus or valgus in order to restore joint congruity and limb alignment and enable early knee mobilisation.3,4,5 Open reduction and internal fixation (ORIF) with plates and screws enables fracture visualization , reduction, and fixation, but results in substantial soft-tissue

dissection and risks wound breakdown, stiffness, and deep infection.6 The small wire external fixator avoids such problems, but risks non-union and pin tract infections.7,8 Minimally invasive plate osteosynthesis (MIPPO) improves the healing rate by minimising disruption of soft tissues (including periosteum) and preserving vascular supply at the fracture site.9,10 The goals of treatment are to restore joint congruity and limb alignment.11 Functional outcome depends mainly on range of knee motion and strength of the quadriceps. Knee stiffness is more clinically

#### relevant than instability in tibial plateau fractures.12

*Aims and Objectives: To study of Complications after Minimally Invasive Percutaneous Plate Osteosynthesis (MIPPO) Technique in patients of Tibial Plateau Fracture*

*Methodology: This is institutional based prospective study which comprises of 50 patients with displaced tibial plateau fracture and were treated between jan 2012 to jun 2013 with minimal invasive percutaneous plate osteosynthesis (MIPPO). All patients were screened using following inclusion and exclusion criteria. Mono-trauma polytrauma patients. Grade I, II, IIIA compound fracture, Medically fit for surgery, < 2 weeks post fracture Were included into study whereas Fracture due to malignancy, Grade IIIB and IIIC compound fractures, Non-ambulatory previous fracture, Severe dementia, Medical contra-indication to surgery were excluded from study. Statistical analysis done by Chi-square test.*

#### Result:

**Table 1. Distribution of Cases According To Age.**

Age (in years)	Number of cases	Percentage
21-30	7	14%
31-40	19	38%
41-50	15	30%

51-60	6	12%
61-70	3	6%
Total	50	100%

In present study, patients were of age group between 20-70 years. Majority of our patients (68%) were in middle age group i.e. 31-50 years. This may be due to more involvement of this age in outdoor and travelling activities in India. 14%, 12% & 6% were in the age group of 21-30 years, 51-60 years & 61-70 years respectively. Mean age in present study was 40.38 years. SD 40.38 ± 10.59.

**Table 2. Distribution Of Cases According To Sex**

Sex	Number of cases	Percentage
Male	36	72%
Female	14	28%

The ratio between male to female was 2.57:1 in this study. There was more male prevalence. The lower incidence of fracture of the tibial Plateau in females may be due to their lesser involvement in outdoor activities.

**Table 3: Distribution of Cases According To Nature of Complications**

Complication	Number of patients
Superficial infection	2
Deep infection	1
Loss of reduction	1
Loss of ROM	2
Delayed union	1
Deformity	2
Instability	2
Extension lag	2

In Present study, superficial infection in form of local stitch abscess developed in two patients, which subsided after local debridement and intravenous antibiotics.

Deep infection in form of frank pus from surgical wound developed in one patient with grade I compound injury which subsided after thorough debridement and wound wash in operation theatre after two weeks. One patient with Schatzker's type V fracture and grade I compound injury gone in delayed union due to chronic infection which eventually united on 22nd weeks.

Loss of range of motion developed in two patients. Two patients developed deformity out of which one developed varus and another one developed valgus. Two patients developed instability at knee joint and those patients also had extension lag more than 10 degrees.

#### Discussion:

Two patient developed superficial infection and another one developed deep infection. Both cases that developed infection were having open fracture. One case of type V fracture with grade 1 compound injury gone in delayed union due to chronic infection which eventually united on 22nd weeks. Loss of range of motion developed in two patients. Two patients developed deformity out of which one developed varus, one developed valgus deformity. Two patients developed instability at knee joint. Two patient developed extension lag. Similar study was conducted by Biggi et al13 in which they found knee stiffness in three patients, malunion in five patients and one patient developed superficial infection.

#### References:

1. DeCoster TA, Nepola JV, el-Khoury GY. Cast brace treatment of proximal tibia fractures. A ten-year follow-up study. *Clin Orthop Relat Res* 1988;231:196-204.
2. Stokel EA, Sadasivan KK. Tibial plateau fractures: standardized evaluation of operative results. *Orthopedics* 1991;14:263- 70.
3. Egol KA, Koval KJ. Fractures of the proximal tibia. In: Bucholz RW, editor. *Rockwood and Green's fractures in adults*. Philadelphia: Lippincott Williams & Wilkins; 2006:1999-2029.
4. Blokker CP, Rorabeck CH, Bourne RB. Tibial plateau fractures. An analysis of the results of treatment in 60 patients. *Clin Orthop Relat Res* 1984;182:193-9.
5. Stevens DG, Beharry R, McKee MD, Waddell JP, Schemitsch EH. The long-term functional outcome of operatively treated tibial plateau fractures. *J Orthop Trauma* 2001;15:312-20.
6. Lachiewicz PF, Funcik T. Factors influencing the results of open reduction and internal fixation of tibial plateau fractures. *Clin Orthop Relat Res* 1990;259:210-5.
7. Khan MA, Khan SW, Qadir RI. Role of external fixator in the management of type II and III open tibial fractures. *J Postgrad Med Inst* 2004;18:12-7
8. Ali AM, Burton M, Hashmi M, Saleh M. Outcome of complex fractures of the tibial plateau treated with a beam-loading ring fixation system. *J Bone Joint Surg Br* 2003;85:691-9.
9. Oh JK, Oh CW, Jeon IH, Kim SJ, Kyung HS, Park IH, et al. Percutaneous plate stabilization of proximal tibial fractures. *J Trauma* 2005;59:431-7.
10. Farouk O, Krettek C, Miclau T, Schandelmaier P, Guy P, Tscherne H. Minimally invasive plate osteosynthesis: does percutaneous plating disrupt femoral blood supply less than the traditional technique? *J Orthop Trauma* 1999;13:401-6
11. Barei DP, Nork SE, Mills WJ, Coles CP, Henley MB, Benirschke SK. Functional outcomes of severe bicondylar tibial plateau fractures treated with dual incisions and medial and lateral plates. *J Bone Joint Surg Am* 2006;88:1713-21.
12. Canadian Orthopedic Trauma Society. Open reduction and internal fixation compared with circular fixator application for bicondylar tibial plateau fractures. Results of a multicenter, prospective, randomized clinical trial. *J Bone Joint Surg Am* 2006;88:2613-23.
13. Biggi F, Di Fabio, C D'Antimo, S. Trevisani; Tibial plateau fracture: internal fixation with locking plates and the MIPO technique. *Injury* 41(11): 1178-1182. nov 2010