ORIGINAL RESEARCH PAPER
Volume - 15 | Issue - 06 | June - 2026 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

FUNCTIONAL OUTCOME OF DISTAL TIBIA PILON FRACTURES TREATED WITH LOCKING COMPRESSION PLATE OSTEOSYNTHESIS: A PROSPECTIVE STUDY OF 10 CASES

Orthopaedics

Dr. Sunil P. Handralmath Professor and Head of department Orthopaedics, Dr. VMGMC Solapur

Dr. Partha P. Santra* Senior Resident, Department of Orthopaedics, Dr. VMGMC Solapur*Corresponding Author

ABSTRACT

Background: Distal tibia pilon fractures are complex injuries associated with significant soft tissue damage and functional impairment. Locking compression plate (LCP) osteosynthesis provides stable fixation with minimal soft tissue compromise. **Aim:** To evaluate the clinical and functional outcomes of distal tibia pilon fractures treated with locking compression plate fixation.**Materials and Methods:** A prospective observational study was conducted on 10 patients with distal tibia pilon fractures treated with LCP osteosynthesis between 2024 and 2025. Functional outcome was assessed using the American Orthopaedic Foot and Ankle Society (AOFAS) score. Radiological union, time to weight bearing, and complications were evaluated.**Results:** The mean age of patients was 36.4 years. Males constituted 80% of cases. Road traffic accidents were the most common mechanism of injury (70%). Mean fracture union time was 3.1 months. The mean AOFAS score improved from 32.5 preoperatively to 86.8 at final follow-up.**Conclusion:** Locking compression plate osteosynthesis is an effective treatment modality for distal tibia pilon fractures, providing good functional outcomes with acceptable complication rates.

KEYWORDS

Distal Tibia, Pilon Fracture, Locking Compression Plate, LCP, Aofas Score

INTRODUCTION

Distal tibia pilon fractures are challenging injuries involving the weight-bearing articular surface of the distal tibia. These fractures are commonly caused by high-energy trauma such as road traffic accidents and falls from height. Management is difficult because of severe comminution, articular involvement, and associated soft tissue injury.

Locking compression plates have gained popularity because they provide angular stability, preserve periosteal blood supply, and allow biological fixation. Minimally invasive plate osteosynthesis techniques further reduce soft tissue complications and improve fracture healing.

Aim and Objectives

1. To evaluate functional outcomes following LCP fixation in distal tibia pilon fractures.
2. To assess radiological union following surgery.
3. To evaluate complications associated with LCP fixation.

Materials and Methods

A prospective observational study was conducted in the Department of Orthopaedics over a period of one year.

Inclusion Criteria:

Skeletally mature patients
Closed distal tibia pilon fractures
AO type A, B, and C fractures
Patients fit for surgery

Exclusion Criteria:

Open fractures
Pathological fractures
Patients medically unfit for surgery

Ten patients with distal tibia pilon fractures treated with locking compression plate osteosynthesis were included. Patients underwent fixation using distal tibia locking compression plates through either anterolateral or minimally invasive medial approach under fluoroscopic guidance.

Patients were followed at 2 weeks, 6 weeks, and 12 weeks. Functional outcome was assessed using the AOFAS score.

RESULTS

Demographic Distribution:

- Total Patients: 10
- Male: 8
- Female: 2
- Mean Age: 36.4 years

Mode of Injury:

- Road Traffic Accident: 7
- Fall from Height: 3

Fracture Union:

- <3 Months: 7 patients
- >3 Months: 3 patients
- Mean union time: 3.1 months

Functional Outcome (AOFAS Score):

- Preoperative: 32.5
- 6 Weeks: 60.4
- Final Follow-Up: 86.8

Final Outcome:

- Excellent: 4
- Good: 5
- Fair: 1
- Poor: 0

Complications:

- Superficial infection – 1 patient
- Delayed union – 1 patient

Case:1

Case:2

DISCUSSION

Distal tibia pilon fractures predominantly affected middle-aged males in this study. High-energy trauma, especially road traffic accidents, remained the most common cause of injury.

Locking compression plate fixation provided stable fixation and satisfactory fracture union. Functional outcome assessed by AOFAS score demonstrated marked improvement following surgery. Most patients achieved excellent to good outcomes, indicating that LCP fixation allows early mobilization and restoration of ankle function.

Complication rates were low and manageable with appropriate postoperative care.

CONCLUSION

Locking compression plate osteosynthesis is a reliable and effective method for treating distal tibia pilon fractures. It provides stable fixation, promotes fracture union, and results in good functional outcomes with minimal complications.

REFERENCES

1. Rüedi TP, Allgöwer M. The operative treatment of intraarticular fractures of the lower end of the tibia. Clin Orthop Relat Res. 1979;138:105-110.
2. Helfet DL, Shonnard PY, Levine D, Borrelli J Jr. Minimally invasive plate osteosynthesis of distal fractures of the tibia. Injury. 1997;28:A42-A47.
3. Mauffrey C, Vasario G, Battiston B, et al. Tibial pilon fractures: review of incidence, diagnosis, treatment, and complications. Acta Orthop Belg. 2011;77:432-440.
4. Gupta RK, Rohilla RK. Locking plate fixation in distal metaphyseal tibial fractures. Int Orthop. 2010;34:1285-1290.
5. Redfern DJ, Syed SU, Davies SJ. Fractures of distal tibia: minimally invasive plate osteosynthesis. Injury. 2004;35:615-620.