



FUNCTIONAL OUTCOME OF INTRA ARTICULAR FRACTURE CALCANEUM TREATED WITH CALCANEUM LOCKING PLATE THROUGH EXTENDED LATERAL APPROACH

Orthopaedics

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ABSTRACT

BACKGROUND: The choice of treatment in case of intra articular calcaneum fracture has been a topic of debate. This study was performed to evaluate the functional outcome of intra-articular fracture calcaneum treated with calcaneum locking plate through extended lateral approach. **Materials and methods-** A prospective randomized study of 20 patients with intra-articular fracture calcaneum conducted at dept of orthopaedics JLNMC Ajmer from Oct 2019 to Nov 2021 and follow up from 6 month to 12 months for the minimum period of 6 months duration. Implant used - Calcaneum locking plate. Classification system - Essex- lopresti classification and Sanders classification. **Results and observation** - Clinical and functional outcomes were assessed using AOFAS Score. Complication of fractures and operative treatment were assessed. The result of entire study group showed 12 excellent, 5 good, 2 fair, 1 poor. **Conclusion** - We observed and recommend that calcaneum locking plate is an optimal tool for fixation of intraarticular fracture calcaneum.

KEYWORDS

Intra articular Fracture calcaneum, calcaneum locking plate, Essex lopresti, Sanders classification, Bohlar and Gissane angle, AOFAS score.

INTRODUCTION

Calcaneal fracture is unsolved problem. In most recent years due to high velocity road traffic accidents and trauma due to the increased high rising construction in our rapidly growing country fall from height is very common in these days. because of these mode of injury the vertebral column fracture, pelvic bone fracture, proximal tibia fracture and major bone fracture are most identified injuries. Due to these injuries calcaneal fracture goes unnoticed, so always patient presented late in hospital because of pain when patient gets up from bed, due to delay in treatment makes it most disabling fracture for future. Calcaneum fracture accounting for 65% of tarsal injury. Bohlar and Gissane angle are crucial for determining anatomical alignment.

Two classification is used in our study for Calcaneum fracture

- 1) Essex lopresti.
- 2) Sanders classification.

Radiologically :

At the time of admission, lateral, oblique, axial and anteroposterior radiograph of the injured foot were made for all the patients. CT. scan of the calcaneum were done to determine the degree of comminution and study of fracture pattern and type.

Complications includes wound edge necrosis, Infection, Malunion, and Heel broadening. Initial Management:- Initially the injured limbs were placed in bulky Jones type dressing with a posterior slab and elevation to reduce the swelling. Operative treatment:- open reduction internal fixation with calcaneum locking plate.

AIMS AND OBJECTIVES

To evaluate functional outcomes of calcaneal fracture treated with calcaneum locking plate.

Objectives of the study

To measure the Primary outcome by :

- 1) Time of union.
- 2) Calcaneum height and width and other anatomical characteristics along with subtalar joint congruity before and after union.

To measure the secondary outcome by:

- 1) Operative Time
- 2) Suture Line Condition
- 3) Complications

MATERIALS AND METHODS

A prospective, single center, controlled study was conducted at the Orthopaedic Department of JLN Medical College, Ajmer OCT. 2019 till Dec. 2021. 20 patients were included in study.

Inclusion Criteria:

- 1) All closed intra articular displaced calcaneum fracture.

Exclusion Criteria:

- 1) Open fracture
- 2) Medical comorbidity
- 3) Un displaced intra articular fracture
- 4) Patient aged below 20yrs.
- 5) Extra articular fracture
- 6) Pt. not willing to be included in our study

Operative treatment:

Operative procedures included open reduction with internal fixation.

Open reduction and internal fixation:

Open reduction with internal fixation was performed in twenty fractures. A calcaneal plate was used in all fracture treated with open reduction internal fixation.

Preoperative Planning

Preoperative counselling & informed written consent of the patient and relatives regarding the method of treatment and prognosis was done and consent for operation was taken.

Hardwares required

1. Steinman pin 3.5 mm
2. K wires 1.8 mm
3. Specially designed calcaneal locking plates, available in three small, medium and large.
4. Locking Cancellous screws 3.5 mm.
5. Ordinary Cancellous screws 3.5 mm.
6. Drill bit 2.7 mm.
7. Drill bit sleeve
8. Measurement device
9. Screw driver
10. Strong elevators
11. Power drill machine
12. Image intensifier.



Operative Technique

All the fractures were operated in lateral decubitus position by keeping a pad in between knees.

Postoperative details

Postoperatively, a posterior below knee slab was applied and the foot was elevated to reduce postoperative swelling. The dressing were checked on third postoperative day. Early range of motion exercises were encouraged after the surgical incision had begun healing or pain subsided, usually 10 to 12 days after surgery.

RESULT

In this study, 20 patients with intra articular fracture calcaneum who were treated with open reduction internal fixation were evaluated.

The study group included patient between 20 and 50 years. The peak incidence was in 25 to 40 years.

Table 1 :Age distribution of study groups:

Age group	Operative	
	N	%
20-29	8	40
30-39	10	50
>40	2	10
Total	20	100

In our study out of 20 patient 10 belong to age group (30-39), 8 belong to (20-29), 2 belong to >40.

Table 2 :Distribution of study subjects according to mode of injury:

Mode of injury	Operative	
	N	%
Fall from height	16	80
RTA	4	20
Total	20	100

In our study out of 20 patient 16 belong to Fall from height, 4 belong to RTA.

Table 3 :Type of fracture (Essex lopresti classification) among study groups

Type of fracture	Operative	
	N	%
Comminuted	6	30
Joint Depression	14	70
Tongue Type	0	0
Total	20	100

Table 4 : Type of fracture (Sander's classification) among study groups

Type of fracture	Operative	
	N	%
Type 2	0	0
Type 3	12	60
Type 4	8	40
Total	20	100

In our study out of 20 patient 12 belong to Type 3 and 8 Type 4.

Table 5 : Bohlar angle among study groups

Bohlar angles mean value	Operative
Pre OP	5.1
Post OP	21.95

Table 6 : Gissane angle among study groups

Gissane angles mean value	Operative
Pre OP	108.2
Post OP	102.75

Table 7 : AOFAS score among study groups.

AOFAS Score	Operative	
	N	Score
Excellent	12	>90
Good	5	80-89
Fair	2	70-79
Poor	1	<70

In our study out of 20 patient 12 shows excellent result and AOFAS score >90, 5 patient shows good result and AOFAS score 80-89, 2 patient shows fair result and AOFAS score 70-79, 1 patient shows poor result and AOFAS score <70.

DISCUSSION:

The treatment of displaced intra articular fracture calcaneum mainly Sanders type 2 and type 3 is ORIF-LCP is preferred option. In agreement with other literature References this approach allowed us for better visibility and proper reduction of fracture. To avoid early complications we must go through indications contra indications and care must be taken in follow up phase.

CONCLUSION

In our study, we observed that open reduction internal fixation is an excellent method of treatment of displaced intra articular fractures calcaneum.

Extensile lateral approach is better for exposure and fracture reduction, although larger study groups is required to arrive at strong conclusion.

Clinical Pictures



Pre-op Radiograph



Post op X-RAY



L shape incision

REFERENCES:

1. Andrew R. Hsu, MD Robert B. Anderson, MD Bruce E. Cohen, MD published J Am Acad Orthop Surg 2015;23: 399-407
2. Barei DP, Bellavarda C, Sangeorzan BJ, Benirschke SK. Jan 2002; Fractures of the calcaneus. Orthop Clin North Am. 33 (1): 263-85
3. Benirschke SK, Sangeorzan BJ. 1993. Extensive intra articular fractures of the foot. Surgical management of calcaneal fractures. Clin Orthop 292: 128-34.
4. Bezes H, Massart P, Delvaux D, Fourquet JP, Tazi F. 1993. The operative treatment of intra articular calcaneal fractures. Indications, technique, and results in 257 cases. Clin orthop 290: 55-59.
5. Brattebo J, Molster AO, Wirsching J. 1995. Fractures of the calcaneus: A retrospective study of 115 fractures. Ortho int 3: 117-26.
6. Burdeaux B.D. Nov 1997; Fractures of the calcaneus: open reduction and internal fixation from the medial side a 21- year prospective study. Foot Ankle Int.; 18(11):685-92.
7. Burdeaux B.D. July / August, 1983, Reduction of Calcaneal Fractures by the Mc Reynolds Medical Approach Technique Clin. Ortho. No. 177, Pg.No.87-103.
8. Buch BD, Myerson MS, Miller SD. 1966. Primary subtalar arthrodesis for the treatment of comminuted calcaneal fractures. Foot Ankle Int. 17: 61-70.
9. Buckley R, Tough S, McCormack R et al. 2002. Operative compared with non operative treatment of displaced intra articular calcaneal fractures: a prospective, randomized, controlled multicenter trial. J Bone Joint Surg Am 84-A: 1733-44.
10. Buckley RE, Meek RN. 1992 Comparison of open versus closed reduction of intra articular calcaneal fractures: a matched cohort in workmen. J Orthop Trauma. ; 6(2):216-22.