



A STUDY ON CLINICAL, FUNCTIONAL AND RADIOLOGICAL OUTCOME OF HIGH VELOCITY TIBIAL PLATEAU FRACTURES MANAGED BY DUAL PLATING

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ABSTRACT

Background: Dual plating in comminuted bi-condylar tibial plateau fractures remains controversial. More methods of treatment have been described. We performed a prospective study to evaluate the Clinical, functional and Radiological outcome of lateral and medial plate fixation of Schatzker type V and VI fractures through an anterolateral approach, and a posteromedial approach. **Material And Method:** We treated 21 high velocity tibial plateau fractures (Schatzker type V and VI) with lateral and medial plates through an anterolateral approach and a posteromedial approach over 2 years period . Radiographs in two planes were taken in all cases. Immediate postoperative radiographs were assessed for quality of reduction and fixation. The outcome was evaluated according to the Honkonen Jarvinen criteria on follow up. **Results:** Of 21 fractures, 7 patients (33.3 %) had Type V fracture and 14 patients (66.7 %) had Type VI fracture. Bone Grafting was used for 9 patients (42.9%) to fill metaphyseal defect. Time required for union ranged from 11 to 16 weeks with average being 12.9 weeks. **Conclusion:** Dual plating provides early mobilisation of the joint. Posteromedial plating provides a buttress to posteromedial fragment and thereby prevents varus collapse. This is a short term study and need follow up to predict the further outcome.

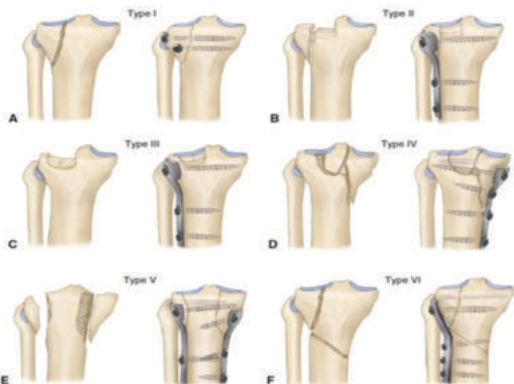
KEYWORDS :

INTRODUCTION

Tibial plateau fractures represent approximately 1 % of fractures in adults^[2]. These fractures occur commonly in 3rd to 5th decade age group. In young adult, motor vehicle accidents, bumper strike injuries are common mode of injury as opposed to elderly with sports injuries and fall as more common mode of injury^[3]. Schatzker's type V &VI fractures occur due to high velocity trauma. They contribute to 20 – 40 % of tibial plateau fractures. The controversy of surgical vs conservative management for high velocity tibial plateau fractures is overcome by enlightening the goals for operative management which are anatomic reduction, restoration of articular congruity and alignment, stable fixation to allow early knee motion.

Among wide spectrum of operative management Dual plating via two incision is preferred technique as it has its own advantages when compared to other modalities of treatment such as Isolated Lateral locking plate, Hybrid external fixator, Ilizarov, LISS. Hence this study is done to emphasize the importance of double plating in management of Schatzker type V &VI fractures based on Honkonen Jarvinen criteria (1992).

SCHATZKER CLASSIFICATION WITH TREATMENT METHODS:



AIMS AND OBJECTIVES:

The aim of the study is to prospectively analyze the clinical, functional and radiological outcome of high velocity tibial plateau fractures managed by dual plating.

MATERIALS AND METHODS:

Source of the study : Santhiram Medical College & General Hospital, Nandyal.
Study design : Prospective study.
Duration of study : June 2022 to November 2022.
Sample size : 21 patients of either sex.

Inclusion Criteria

- Patients with High velocity tibial plateau fractures who are,
- 1) Skeletally mature & age between 20 – 60 years
 - 2) Included in Schatzkers Classification of tibial plateau fractures Type V &VI.
 - 3) Patients who are willing to give written informed consent.

Exclusion Criteria:

- Patients who are
- 1) NOT willing to give written informed consent.
 - 2) Open fractures
 - 3) Associated pre-existing joint disease (osteoarthritis)

RESULTS

Honkonen Jarvinen Criteria was used for evaluating Clinical, Functional and Radiographic results.

HJ Clinical Outcome:

Criteria	Excellent	Good	Fair	Poor
Extension lag	21(100 %)	-	-	-
Knee flexion	11 (52.3%)	8(38.1%)	2(9.5%)	-
Thigh atrophy	19	2(9.5%)	-	-
Instability	17 (81%)	4(19%)	-	-
Mean %	81%	16.6%	2.4%	-

HJ Functional outcome:

Criteria	Excellent	Good	Fair	Poor
Walking	21 (100%)	-	-	-
Stair climbing	20 (95%)	1 (4.8%)	-	-
Squatting	13 (61.9%)	8 (38.1%)	-	-

Jumping	11 (52.4%)	6 (28.6%)	3 (14.3%)	1 (4.8%)
Duck walking	11 (52.4%)	5 (23.8%)	4 (19%)	1 (4.8%)
Mean %	72.3%	19.1%	6.7%	1.9%

HJ Radiological outcome:

Criteria	Excellent	Good	Fair	Poor
Plateau tilt	19(90.5%)	2(9.5%)	-	-
Varus / valgus tilt	21(100%)	-	-	-
Articular step off	18(85.7%)	3(14.3%)	-	-
Condylar widening	17(81%)	4(19%)	-	-
Joint space narrowing	16(76.2%)	4(19%)	1 (4.8%)	-
Mean %	87%	12%	1%	-

DISCUSSION:

Complex tibial plateau fractures still remain a challenge to most Orthopaedic surgeons. Road traffic accident being the commonest mode of injury leading to these high velocity fractures.

With the advent of isolated lateral plating with locking compression plate, the spectrum has shifted towards locking plate with medial fragment being stabilized by screws passed through lateral plate. Varus collapse in these patients raised the question of its sustainability and the reason found to be inadequate fixation of posteromedial fragment. This has paved way for dual plating via two incision technique. A double incision Double plating technique is recommended by the Association for Osteosynthesis /Association for the Study of Internal Fixation for the treatment of complex tibial plateau fractures

Locking plates provide fixed angle stability and we hypothesized that using lateral locking plates instead of buttress plate may help to prevent Secondary loss of reduction and alignment. If secondary loss of reduction occurs, osteoarthritis will occur even if primary was satisfactory

In our study, males outnumbered females in the ratio 3.2 : 1 .This is explained by more active life style of males and higher chance of road traffic accidents. This is in accordance with the series of 14 patients reported by Eggli et al , in which 10 were male and 4 were female.

All 21 patients sustained road traffic accident. Distribution of incidence between sides were near equal. We had 7 schatzker Type V & 14 schatzker Type VI with preponderance of the latter. Our study reported Honkonen Jarvinen Clinical outcome to be 81% excellent, 16.6% good and 2.4% fair. The functional outcome was 71.3 % excellent, 19.1 % good , 6.7 % fair and 1.9 % poor. The Radiological outcome showed 87 % excellent, 12 % good, 1 % fair results. Bone grafts were used in 9 (42.9 %) of 21 patients after elevation of depressed articular surface. The mean time of union was 12. 9weeks ranging from 11 to 16 weeks. Bone grafting did not contribute to faster healing as metaphyseal defects heal well without bone grafts. In the report published by Eggli et al bone grafting was employed in 11 of 14 patients.

Knee flexion of 95° and 100° was noted in two patients and physiotherapy was encouraged. Superficial infection occurred in 3 patients and healed with debridement, wound dressing and intravenous antibiotics. Occasional pain in 4 patients was managed with analgesics.

CONCLUSION

From our study we conclude that,

- High velocity tibial plateau fractures treated with dual plating have excellent to good clinical, functional and radiological outcome .
- Early mobilization of the joint provides good range of motion.
- Posteromedial plating provides a buttress to posteromedial fragment and thereby prevents varus collapse.

- The patients with good soft tissue cover should undergo anatomical reduction and rigid fixation immediately without deferring time.
- This is a short term study and need follow up to predict the further outcome.

Image Showing Some Post Of Xrays



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