

A prospective study on proximal tibial fractures managed by dual plating

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Abstract

Background: Tibial plateau fractures are challenging, attributing to the fact of their increased incidence, complexity, associated complications, and availability of different treatment options. The aim of the study was to analyse the clinical, functional and radiological outcome of proximal tibial fractures managed by dual plating. **Methods:** The Prospective study included 12 cases at Department of Orthopedics, Kamineni Institute of Medical Sciences Narketpally, Telangana, the study was conducted on September 2019 to October 2021. Patients with age between 20 to 60 years and Schatzker's Classification of tibial plateau fractures Type V and VI and Gustilo-Anderson type I and II compound proximal tibial fractures were included for the study. **Results:** The incidence of male was more compared to females in the ratio of 5:1. The incidence of fracture on left side was higher. The study also observed the findings based on functional and clinical outcomes after surgeries. **Conclusion:** Early mobilization of the joint provides good range of motion. High velocity tibial plateau fracture have excellent to good clinical, functional and radiological outcome

Keywords: Proximal Tibial Fractures, Bicondylar, Schatzker type V and VI, Dual Plating,

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INTRODUCTION

The operative treatment of complicated bicondylar fractures of the tibial plateau remains a challenge to even the most experienced surgeons. Fractures of tibial plateau are intra-articular fractures of major weight bearing joint.¹ They occur as a result of a combination of vertical thrust and bending. Proximal Tibia fractures represent a wide spectrum of severity which ranges from simple injuries with predictable excellent outcome after non-operative treatment to complex fracture patterns that challenge even most experienced surgeons.² Proximal Tibial fractures represent approximately 1% of fractures in adults.² These fractures occur commonly in 3rd to 5th decade age group.

In young adults, motor vehicle accidents, bumper strike injuries are common mode of injury as opposed to elderly with trivial fall as more common mode of injury.³ Schatzker's type V and VI fractures occur due to high velocity trauma. They contribute to 20 – 40 % of proximal tibia fractures⁴. They include bicondylar fractures and proximal meta-diaphyseal dissociation fractures. In these fractures local soft tissue injury, compartment syndrome, associated ligament instability has to be looked for.³ The controversy of surgical vs. conservative management for proximal tibia 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.⁴

Among wide spectrum of operative management Dual plating via two incisions 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.⁵ Hence this study will be done to emphasize the importance of dual plating in management of Scahtzker type V and VI fractures based on Honkonen Jarvinen criteria (1992). The aim of the study was to analyze the clinical, functional and radiological outcome of proximal tibial fractures managed by dual plating.

METHODS

The Prospective study included 12 cases at Department of Orthopedics, Kamineni Institute of Medical Sciences Narketpally, Telangana, the study was conducted on September 2019 – October 2021. Study subjects were included after detailed explanation about the study and obtaining written informed consent and Ethical Committee approval was also obtained before starting of the study.

Inclusion Criteria: 1. Age between 20 to 60 years. 2. Included Schatzker’s Classification of tibial plateau fractures Type V and VI. 3. Gustilo-Anderson type I and II compound proximal tibial fractures.

Exclusion Criteria: 1. Patient age less than 20yrs and more than 60 years. 2 Schatzker type I to IV. 3. Patients with Gustilo - Anderson Type 3 compound proximal tibial fractures. 4. Associated Neurovascular injury / head injury. 5. Compartment syndrome. 6. Polytrauma. 7. Pathological Fractures.

RESULTS

Table 1: Age distribution for proximal tibial fractures (n=12)

Age (in years)	Number
20-30	4 (33.34%)
31-40	2 (16.67%)
41-50	4 (33.34%)
51-60	2 (16.67%)
Total	12 (100%)

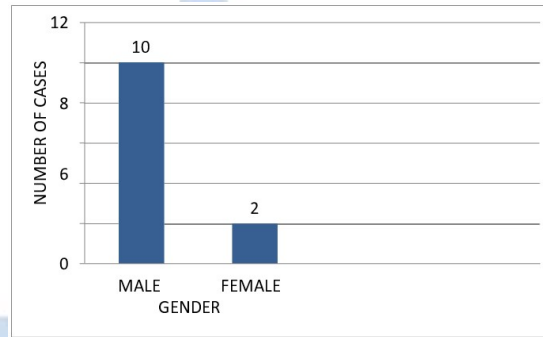


Figure 1: Gender distribution for proximal tibial fractures (n=12)

Among 12 cases, the incidence of fracture in age group 20 -30 and 41-50 was 66.68% (table 1). The incidence of male was more compared to females in the ratio of 5:1(Figure 1).

Table 2: Side of tibia injury (n=12)

Side	Number
RIGHT	4 (33.33%)
LEFT	8 (66.67%)
Total	12 (100%)

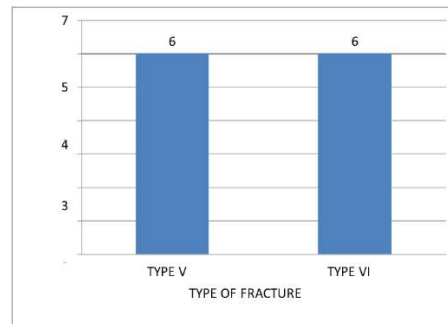


Figure 2: Type of schatzker’s fracture (n=12)

The nature of injury is high velocity injury as it is explained by all patients sustaining road traffic accident. The incidence of fracture on right side was 33.33 % and on left side was 66.67% which was higher (Table 2). Of 12 patients, 6 patients (50%) had Type V fracture and 6 patients (50%) had Type VI fracture (Figure 2).

Table 3: Distribution of cases according to functional outcome (n = 12)

Criteria	Excellent	Good	Fair
Walking	10 (83.33%)	2 (16.67%)	0
Stair Climbing	8 (66.67%)	2 (16.67%)	2 (16.67%)
Squatting	8 (66.67%)	3 (25%)	1 (8.33%)
Jumping	10 (83.33%)	1 (8.33%)	1 (8.33%)
Duck Walking	8 (66.67%)	2 (16.67%)	2 (16.67%)

10 patients were able to walk normally and 2 patients had slight limp. 8 patients had normal stair climbing, impaired in 2 patients, one at a time in 2 patients. 8 patients were able to squat normally, impaired in 3 patients and squatting <90 degrees in 1 patient. 10 patients were able to jump normally, impaired in 1 patient and 1 patient was able to jump only with the aid of uninjured leg. 8 patients were able to duck walk normally, 2 patients were able to keep only a few steps and 2 patients were able to keep only one step (Table 3).

Table 4: distribution of cases according to clinical outcome (n=12)

Criteria	Excellent	Good	Fair
Extension Lag	8 (66.67%)	4 (33.33%)	0
Flexion Range	6 (50%)	5 (41.67%)	1 (8.33%)
Thigh Atrophy	6 (50%)	4 (33.33%)	2 (16.67%)
Stability	8 (66.67%)	3 (25%)	1 (8.33%)

8 patients had no extension lag and 4 patients had 1-5° extension lag. The average knee flexion was >130° for 6 patients, 110-129° for 5 patients and 1 patient had 90-109°. 6 patients had no thigh atrophy, 4 patients had 0 – 1 cm thigh atrophy and 2 patients had 1 – 3 cm thigh atrophy. Stability was normal in 8 patients, grade I antero-posterior instability in 3 patients and grade II antero-posterior instability in 1 patient (table 4).

DISCUSSION

The present study was aimed to analyze the clinical, functional and radiological outcome of proximal tibial fractures managed by dual plating. Intra articular tibial plateau fractures are complex fractures accounting for about 1.2% of all fractures.⁶ They affect knee function and stability which results in considerable morbidity. These fractures are caused by high velocity injuries and often associated with severe comminution and soft-tissue damage.⁷ The goals of treatment are to restore joint congruity, limb alignment and early mobilization of joint. In the present study, among 12 cases, the incidence of male was more in age group 41-50. Hasnain Raza,⁸ in their study of assessing the functional outcome of tibial condyle fractures of 41 patients by minimally invasive Plate osteosynthesis by Rasmussen⁹ functional score 35 found excellent results in 18 patients, good in 19 patients and 4 patients had unacceptable results. The mean rasmuseen score was found to be 25.3 and range of knee flexion was 118 degrees. In our study mean rasmuseen score was found to be 26.1 and average range of knee flexion was found to be 120.9 degrees. Of which 5 patients had excellent and 5 patients had good results. Only 2 patients had fair results. Mechanism of injury was road traffic accident for all these patients. The fractures were classified by Schatzker's classification. Stable internal plate fixation without damaging the soft-tissue envelope is very difficult to achieve, only fair results are seen in 20% to 50% in these fractures. in the present study, there were 6 Schatzker Type V and 6 Schatzker Type VI. Similar observation were also

seen in study by Chang-Wug and group.¹¹ in their study on double plating of (twenty three) type V and type VI proximal tibial fractures using minimally invasive percutaneous Osteosynthesis found eighteen patients with excellent, three patients with good and two patients with fair results. In the present study, functional outcome was 73.33% excellent, 16.66% good and 10% fair. Similar observation was also explained by Prasad and group (12) in his study reported 40 patients fixed with double plating and based on Oxford Knee Society score 30 patients had excellent and 10 patients had good outcome respectively. Present results also show that, 10 patients were able to walk normally and 2 patients had slight limp. 8 patients had normal stair climbing, impaired in 2 patients, one at a time in 2 patients. 8 patients were able to squat normally, impaired in 3 patients and squatting <90 degrees in 1 patient. 10 patients were able to jump normally, impaired in 1 patient and 1 patient was able to jump only with the aid of uninjured leg. 8 patients were able to duck walk normally, 2 patients were able to keep only a few steps and 2 patients were able to keep only one step. Our results are in accordance with Pun and group.¹³ their study reported the outcome of 17 tibial plateau fractures. 9 of which were managed by dual plating and 8 managed by hybrid ex fix. Based on Honkonen Jarvinen Criteria all patients could walk, climb stairs, jump, 90% could squat, 50% could duck walk, and 85% had plateau tilt. Present study reported Honkonen Jarvinen Clinical outcome to be 58.33% excellent, 33.33% good and 8.33% fair. Similar observation was made by 14. Satheesh group.¹⁴ their study

reported 22 patients with tibial plateau fractures treated with dual plating. The outcome was assessed based on Knee Society Score 86.4 % had excellent, 9.1% had well, 4.5 % had fair and no one showed poor results. To conclude from the present study that, posteromedial plating provides a buttress to posteromedial fragment and thereby prevents varus collapse. Early mobilization of the joint provides good range of motion. High velocity tibial plateau fracture have excellent to good clinical, functional and radiological outcome

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