MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2025.2.94.96

OPEN ACCESS

Key Words
Tibialplateau fractures, clinical profile, schatzker type

Corresponding Author
C.Y.G Keerthi,
Department of Orthopaedics, Shri Atal Bihari Vajpayee Medical College and Research Institute, Bangalore, Karnataka, India

Author Designation
[1]Senior Resident
[2]MBBS, D.Ortho
[3]Assistant Professor
[4]Consultant Orthopedician

Received: 20 November 2024
Accepted: 10 January 2025
Published: 16 January 2025

Citation: Rahul Gawalkar, R. Kishore Kumar, C.Y.G Keerthi and Vittobha Gawalkar, 2025. A Study on Clinical Profile of Patients with Tibial Plateau Fractures Attending Tertiary Care Hospital. Res. J. Med. Sci., 19: 94-96, doi: 10.36478/makrjms. 2025.2.94.96

A Study on Clinical Profile of Patients with Tibial Plateau Fractures Attending Tertiary Care Hospital

[1]Rahul Gawalkar, [2]R. Kishore Kumar, [3]C.Y.G Keerthi and [4]Vittobha Gawalkar

[1,3]Department of Orthopaedics, Shri Atal Bihari Vajpayee Medical College and Research Institute, Bangalore, Karnataka, India
[2]DNB Orthopedics, Registrar, SS Sparsh Hospital, Rajarajeshwari Nagar, Bangalore, Karnataka, India
[4]Harikrishna Hospital, Shahpur, Yadgir, Karnataka, India

ABSTRACT
Tibial plateau fractures are a risk to the functional integrity of the knee. They are the result of axial compressive forces alone or combined with varus or valgus stress on the knee joint. The geometry and deviation of the fracture depend on several factors, including the magnitude and direction of the force applied, the degree of knee flexion during the accident and finally, the bone quality. A detailed history regarding demographic profile, modes of injury, associated injuries and comorbidities were recorded in preset proforma. A through general physical and systemic examination was carried out to look for underlying exclusion criteria. X-ray knee in standard AP and Lateral view was taken. In this study, plate and screw group included 54.16% Schatzker Type I-IV and 45.83% Schatzker Type V-VI tibial plateau fractures whereas 45.83% Schatzker Type I-IV and 54.16% of Schatzker Type V-VI tibial plateau fractures in hybrid ilizarov group. P-value was found to be 0.564 which is <0.05, hence Schatzker type is not statically significant between two groups.

INTRODUCTION

Fractures of the tibial plateau involve the articular surface of the proximal tibia. This group of fractures range from simple injuries with predictably excellent outcomes after non-operative treatment to complex fractures pattern that challenge even the most experienced surgeons. Tibial plateau fractures represent approximately 1.2% of fractures in adults[1]. Fractures in men occur at younger age and tend to be the result of high energy trauma but women have increasing incidence with advancing age particularly the seventh decades, which indicates these fractures occurring in osteopenic bone[2]. Motor vehicles accidents, fall from heights, pedestrians-struck and even a simple fall in elderly people are common mode of injuries[3]. Tibial plateau fractures are a risk to the functional integrity of the knee. They are the result of axial compressive forces alone or combined with varus or valgus stress on the knee joint. The geometry and deviation of the fracture depend on several factors, including the magnitude and direction of the force applied, the degree of knee flexion during the accident and finally, the bone quality[4]. In younger patients, the fragments tend to be larger and in wedges due to the shear forces involved. In elderly patients, on the other hand, pure depression fractures are the most common, usually caused by lower energy trauma[5]. Residual articular incongruity and instability can result in posttraumatic osteoarthritis[6].

MATERIALS AND METHODS

Study Type: Prospective randomized controlled trial.

Sample Size: Total sample size = 48 i.e. 24 in each group.

Inclusion Criteria: All adult (>18 yrs) with Tibial Plateau Fractures Schatzker TYPE I to TYPE VI attending Department of Orthopaedics.

Exclusion Criteria:

- A pathologic fracture.
- A preexisting joint disease which interferes with rehabilitation.
- Open growth plates (age <18 yrs)., age >65 yrs.
- A vascular injury requiring repair (Gustilo Grade-IIIC fracture).
- Patient not fit for surgery.
- Not willing to provide consent.

Allocation: All patients attending to Emergency and Orthopaedics Outpatients Clinic with tibial plateau fractures were screened for eligibility by clinico-radiological evaluation and informed consent was taken from eligible candidates and were randomized by Excel random number generation into two groups.

Group A: Plate and screw.

Group B: Hybrid ilizarov.

Intervention: Patients with final diagnosis of Tibial Plateau Fracture presented to Orthopaedics out Patients Clinic and Emergency were signed informed consent enrolled in the study.

- A detailed history regarding demographic profile, modes of injury, associated injuries, and comorbidities were recorded in preset proforma.
- A through general physical and systemic examination was carried out to look for underlying exclusion criteria.
- X-ray knee in standard AP and Lateral view was taken.
- A prior informed and written consent were taken from each patient after explaining about the modes of plating, complications and possible outcomes.
- Preoperative and Post-operative Hb% were recorded.
- Prophylactic IV antibiotic as 2nd generation Cephalosporin with Aminoglycoside (Inj. Cefuroxime + Inj. Amikacin) were administered to both the groups.
- Surgery was performed under general or spinal anesthesia. Patient was set up in the supine position on the operating table, with traction applied.
- A tourniquet was used to diminish blood loss and deflated after no more than two hours.

RESULTS AND DISCUSSIONS

Table 1: Age Distribution in Two Groups

Age Groups	Plate and screw n (%)	Hybrid ilizarov n (%)	Total	P-value
20-39	7(14.5)	10 (20.83)	17	N.A.
40-59	16(33.33)	13(27.08)	29	
60 and above	1(2.08)	1(2.08)	2	
Total	24	24	48	

In this study, most common age group was found to be 40-60 yrs of age., 33.3% and 27.08% respectively in two groups.

Table 2: Gender Distribution in Two Groups

Gender	Plate and screw n (%)	Hybrid ilizarov n (%)	Total	P-value
Male	19 (79.16)	15 (62.5)	25	0.204
Female	5(20.83)	9 (37.5)	5	
Total	24	24	30	

In this study, mostly males were injured and sustained tibial plateau fractures.79.16% were males and 20.83% were females in plate and screw group whereas 62.5% were males and 37.5% were female in hybrid ilizarov group.

Table 3: Side Distribution in Two Groups

Side	Plate and screw n (%)	Hybrid ilizarov n (%)	Total	P-value
Right	17(70.38)	11(45.83)	28	0.79
Left	7 29.62)	13(54.16)	20	
Total	24	24	48	

In this study right side was involved in 70.38% in plate and screw group and 45.83% in hybrid ilizarov group whereas left side was involved in 29.62% in plate and screw group and 54.16% in hybrid ilizarov group. P-value was found to be 0.079 which is greater than 0.05, hence side distribution not is statically significant among two groups.

Table 4: Fracture Type in Two Groups

Schatzker Type	Plate and screw n(%)	Hybrid ilizarovn (%)	Total	P-value
Type I-IV (Unicondylar)	13(54.16)	11(45.83)	24	0.564
Type V-VI (Bicondylar)	11(45.83)	13(54.16)	24	
Total	24	24	48	

In this study, plate and screw group included 54.16% Schatzker Type I-IV and 45.83% Schatzker Type V-VI tibial plateau fractures whereas 45.83% Schatzker Type I-IV and 54.16% of Schatzker Type V-VI tibial plateau fractures in hybrid ilizarov group. P-value was found to be 0.564 which is greater than 0.05, hence Schatzker type is not statically significant between two groups.

Table 5: Modes of Injury in Two Groups

Mode of injury	Plate and screw n(%)	Hybrid ilizarovn(%)	Total	P-value
Fall	7(29.1)	9(37.5)	16	N.A.
RTA	13(54.16)	12(50)	25	
Slip	4(16.66)	3(12.5)	7	
Total	24	24	24	

In this study, road traffic accident was found to be most common mode of injury in both groups with 54.16% in plate and screw group and 50% in hybrid ilizarov group. 29.1% patients in plate and screw group and 37.5% patients in hybrid ilizarov group had history of fall whereas 16.66% patients in plate and screw group and 12.5% patients in hybrid ilizarov group had history of slip on ground.

RESULTS AND DISCUSSIONS

Tibial plateau fracture, representing the Schatzker V and VI fractures represent a challenging problem. Any treatment protocol should aim at restoring articular congruity and the metaphyseal and diaphyseal dissociation-both of these are equally important for long term outcome[7]. Historically, closed treatment of displaced tibial plateau fractures including traction and immobilization resulted in unacceptably high rates of malunion and joint stiffness. Operative treatment of displaced bicondylartibial plateau fractures is current standard care[8]. In this study, preoperative conditions were comparable between two groups in terms of socio-demographic variables, mode of injury, immediate treatment method and immediate complications. Mean age was found to be 44 and 40 yrs respectively, similar finding was noted i.e. 47 yrs and 43 yrs by Krupp *et al*, Lee *et al* respectively[8]. Road traffic accident was found to be common mode of injury in both group, similar finding noted by Krupp[8].

CONCLUSION

In this study, plate and screw group included 54.16% Schatzker Type I-IV and 45.83% Schatzker Type V-VI tibial plateau fractures whereas 45.83% Schatzker Type I-IV and 54.16% of Schatzker Type V-VI tibial plateau fractures in hybrid ilizarov group.

REFERENCES

1. Gardner, M.J., S. Yacoubian, D. Geller, M. Pode, D. Mintz, D.L. Helfet and D.G. Lorich, 2006. Prediction of Soft-Tissue Injuries in Schatzker II Tibial Plateau Fractures based on Measurements of Plain Radiographs. The J. Trauma: Injury, Infec., Crit. Care, 60: 319-324.
2. N. Soucacos. and P. JPAPSTFMSK., 2006. Complications after tibia plateau fracture surgery. Injury, 37: 475-484.
3. Musahl, V., I. Tarkin, P. Kobbe, C. Tzioupis, P.A. Siska and H. ,C Pape, 2009. New trends and techniques in open reduction and internal fixation of fractures of the tibial plateau. British Editorial Society of Bone and Joint Surgery, The J. Bone Joint Surg.. Br. volume, 91: 426-433.
4. Ali, A.M., M. Saleh, S. Bolongaro and L. Yang, 2003. The strength of different fixation techniques for bicondylar tibial plateau fractures—a biomechanical study. Clin. Biomech., 18: 864-870.
5. Prasad, G.T., T.S. Kumar, R.K. Kumar, G.K. Murthy and N. Sundaram, 2013. Functional outcome of Schatzker type V and VI tibial plateau fractures treated with dual plates. Indian J. Orthop.s, Vol. 47 .10.4103/0019-5413.108915.
6. Stevens, D.G., R. Beharry, M.D. McKee, J.P. Waddell and E.H. Schemitsch, 2001. The Long-Term Functional Outcome of Operatively Treated Tibial Plateau Fractures. J. Orthop. Trauma, 15: 312-320.
7. Kumar, G., N. Peterson and B. Narayan, 2011. Bicondylar tibial fractures: Internal or external fixation? Indian J. Orthop.s, 45:116-124.
8. Krupp, R.J., A.L. Malkani, C.S. Roberts, D. Seligson, C.H. Crawford and L. Smith, 2009. Treatment of Bicondylar Tibia Plateau Fractures Using Locked Plating Versus External Fixation. Orthopedics, Vol. 32 .10.3928/01477447-20090624-11.