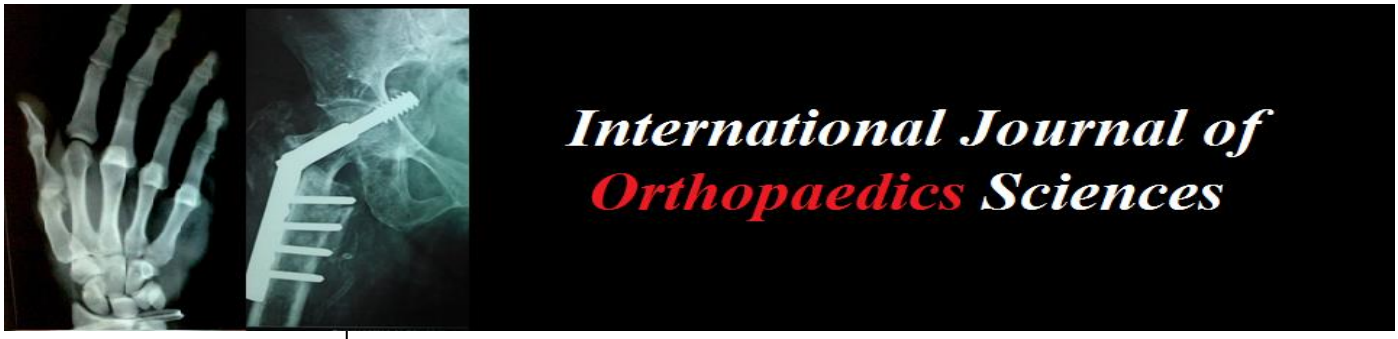

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Study on outcome of posteromedial buttress plating in proximal tibia fracture

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Abstract
Introduction: Proximal tibia fractures having posteromedial (PM) fragment is very necessary to reduce, to maintain knee joint articular congruity, alignment and movement. Because of morphology of fracture, lateral locking plate may not be sufficient to hold posteromedial fragment, so we used posteromedial buttress plate for posteromedial fragment.
Aims & Objectives:
1) To assess functional & radiological outcome and complication of posteromedial buttress palting.
2) To evaluate role of posteromedial buttress plating in preventing late collapse & subsequent varus deformity.
Materials &Methods: This was a prospective case study carried out between Dec 21 to Dec 22 at SSGH, BARODA. 20 patients with schatzker type IV, V, VI having PM fragment included. They all were operated with posteromedial buttress plate. These patients were followed up at 2 week, 1 month, 3 month, 6 month & outcome was assessed according to rasmussen's radiological & functional scoring.
Results: Excellent outcome was found in 70% patients, good outcome in 20% patients, fair outcome in 10% patients & no case of poor outcome. There were no case of loss of articular reduction or varus collapse.
Conclusion: Posteromedial fragment in proximal tibia fracture is best managed by posteromedial buttress plate. Properly planned, rigid fixation with accurate anatomical reduction results in overall excellent outcome with low rate of complication.

Keywords: Posteromedial buttress, proximal tibia fracture, plating

Introduction
Knee joint is one of the three major weight bearing joints in the lower extremity. Fractures of proximal tibia that extend into the knee joint are termed as the tibial plateau or condylar fractures. Proximal tibial fractures are one of the common intra articular fractures, resulting from direct axial or indirect coronal compressive forces. It comprises1% of all fractures & 8% of the fractures in elderly. The majority of tibial plateau fractures are caused due to high speed motor vehicle accidents, violent trauma & fall from height where fractures results from direct axial compression, usually with a valgus (more common) or varus moment & indirect shear forces. Posteromedial fracture of proximal tibia occur as an independently or as a part of bicondylar fractures. Barei *et al*. using a computed tomography (CT) scan study demonstrated the presence of the posteromedial fragment in nearly 33% of bicondylar fractures. Posteromedial fragment is very important for knee joint stability and movements, thus These are serious injuries that frequently result in functional impairment, as they affect knee alignment, stability and movements. Earlier tibial condylar fractures were treated conservatively which resulted in joint line incongruity, osteoarthritis, knee stiffness, malunion and nonunion. With advancement in management of fractures in general, open reduction and internal fixation of tibial condylar fractures were begun in view of maintaining the congruity of articular surface, thus reducing the incidence of osteoarthritis. In surgical management also earlier there was internal fixation done by screws and wires. Then came simple conventional plate, then locking plate on lateral side. however, it seems that this technique may be suboptimal, when a posteromedial shear fragment is present, because screws positioned

through lateral plate are in coronal plane and are frequently parallel to fracture line of posteromedial fragment, thus posteromedial fragment does not fixed by lateral plate. Recently concept of dual plating and for large posteromedial fragment, use of posteromedial buttress plate advocated to prevent late collapse & subsequent varus deformity.

Materials & Methods

A: Sample Design: Interventional Prospective study
B: Sample Size: 20 approx.
C: Duration: January 2022 to January 2023

Inclusion criteria

a) All patients with proximal tibia plateau fracture schatzker type IV, V, VI
b) Above18 years
c) Patients able to walk without assistance before injury.
d) Patients without any previous disabilities and deformities.

Exclusion criteria

a) Age: Less than 18years.
b) Patients who are medically unfit for the surgery.
c) Gustio Anderson type III fractures.

Surgical technique

Posteromedial approach is taken for treating fracture of posteromedial fragment of proximal tibia. This approach is based over the posteromedial border of the tibia. The patient is most commonly positioned supine, which allows access to the front of the knee for a second anterolateral approach for bicondylar tibia fracture. Here, leg is externally rotated, allowing easy access. Alternatively, the patient can be positioned prone, which makes the posterior to anterior hardware easier to place and facilitates fracture reduction by knee extension [5] which comonly done in isolated posteromedial fracture. Skin incision length varies according to fracture location & selected plate. Incision is made in parallel 1-2 cm posterior to the posterior tibial border. During subcutaneous dissection, identify saphenous vain and nerve and mobilize anteriorly. Incision must be posterior enough to allow hardware to be placed from the posterior aspect of the tibia without the posterior skin flap obstructing the screw paths. The deep interval is between the posterior border of the pes anserine tendon and the medial head of the gastrocnemius. A retractor under the medial head protects the popliteal fossa structures. To directly visualize the bone, the popliteus origin must be lifted and retracted laterally. This often directly exposes the apex of the fracture. Posteromedial buttress plate should be placed posteromedially centering over apex of fracture. Commonly posteromedial fragment is displaced distally & medially. To achieve reduction push fractured fragment laterally & proximally. First screw (3.5 mm bicortical screw) is drilled just distal to the fracture line below the apex.as the screw tightened plate pushes on shear fragment proximally & anterolaterally. Additional screws, including lag screws through proximally will augment this reduction.

Fig 1: Skin incision

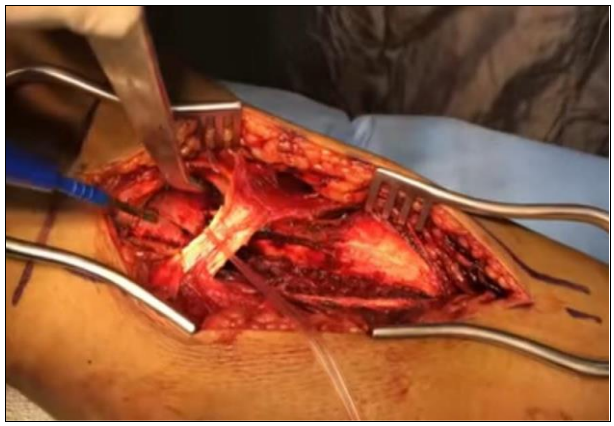

Fig 2: Dissection

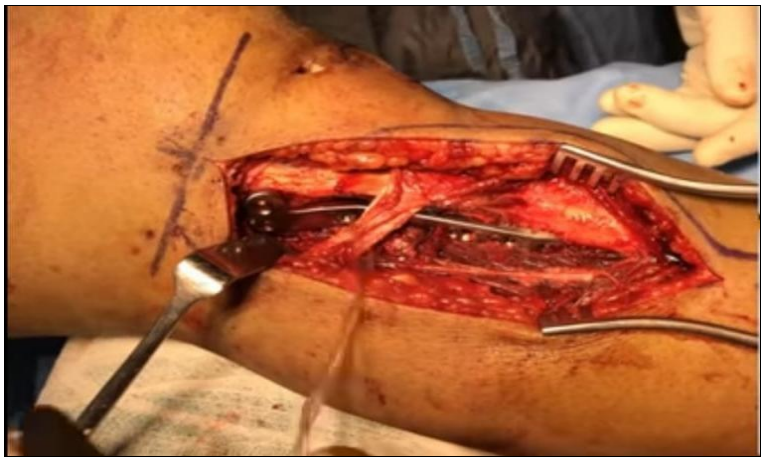

Fig 3: Plate Positioning

Fig 4: Pre-operative X ray

Fig 5: Immediate post-op X ray

Fig 6: Movement at Final follow up

Result

A prospective study of 20 cases of Proximal tibia fracture having posteromedial fragment carried out in tertiary care hospital and following observations were made.

Table 1: Mode of Injury

Mode of injury	Cases	Percentage
RTA	17	85%
Fall	3	15%
Total	20	100%

Table 2: Type of Fracture

Schatzkar type	Cases	Percentage
Type IV	12	60%
Type V	5	25%
Type VI	3	15%
Total	20	100

Table 3: Complication

Complication	Cases
Pain	4
Infection	2
ROM<90	2
Varus	0
Arthritis	0

Table 4: Rasmussen Scoring

Functional Results (Rasmussen's Scoring)	No. of case	Percentage
Excellent	14	70%
Good	4	20%
Fair	2	10%
Poor	0	0%

Discussion

- Here, fracture line is located at coronal plane of a knee joint in case of postero-medial tibial plateau fracture. For such fractures, since posterior-anterior and lateral X-ray film easily results in missed diagnosis, and additional oblique film X-ray, 3D CT Scan are needed as the control so as to further understand medial fracture morphologies.
- Barei *et al*. CT based study demonstrated the occurrence of a postero medial fragment in approximately one third of AO/Orthopedic Trauma Association C-type bicondylar tibial plateau fractures. This is clinically relevant because laterally applied fixed angle plate/screw devices that are used to treat bicondylar tibial plateau fractures may not effectively neutralize this osteoarticular fragment and require alternate or supplemental exposure or fixation strategies.
- Boeck described that postero medial fragment may displace distally and medially especially when the knee is flexed, if it is not fixed properly. thus posteromedial buttress plating proposed to maintain stability of knee joint
- Brunner *et al*. described a posterior approach for direct reduction and fixation of posteromedial fragment in 39 patients using posteromedial buttress plate. all patients were highly satisfied with postoperative results.
- We study 20 cases in whom posteromedial buttress plate has been used for anatomical and rigid fixation there was mainly a large posteromedial fragment which could not fixed without buttress plate. Here plate work as an anti-gliding mechanism and maintain intraarticular reduction.
- The period of immobilization was again individualized depending on the security of rigid fixation and other circumstances demand. The benefit of early knee motion include lesser knee stiffness and improved cartilage healing (regeneration). However, these benefits are to be cautiously balanced by risks, including loss of fracture

reduction, failure of internal fixation and compromised ligament and soft tissue healing.
- In our study according to Rasmussens functional scoring, we have achieved excellent outcome in 70%, good in 20%, fair in 10% case.

Conclusion
The main aim of surgical treatment include precise reconstruction of the articular surface with elevation of the depressed bone fragment, bone grafting when required. Postero Medial buttress plating is desirable in fracture pattern with unstable medial condyle, to prevent delayed medial collapse and undesirable varus deformity. Early active physiotherapy and maintenance of rehabilitation protocols proved to be the independent factor influencing functional result.

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References
1. Kenneth Koval J, Joseph Zuckerman D. Handbook of Fractures, 4thed., Lippincott, Williams & Wilins, Chapter, 36, 455.
2. Moore TM, Patzakis MG, Harvey JB. Tibial plateau Fracture definition, demographics, treatmentrationale, and the long–term results of closed traction management or operative reduction. J Orthop trauma. 1987;1:97-119.
3. Roberts JM. Fractures of the condyles of the tibia, ananatomical and clinical end result study of 100 cases. J Bone & Joint surg. 1968;50(Am):1505.
4. Georgiadis GM. Combined anterior and posterior approaches for complex tibial plateau fractures. J bone joint surg Br. 1994;76B:285-2889.
5. Barei DP, O'Mara TJ, Taitsman LA, *et al*. Frequency, fracture morphology of the posteromedial fragment in the bicondylar tibial plateau fracture patterns. J Orthop Trauma. 2008;22:176-182.
6. De Boeck H, Opdecam P. Posteromedial tibial plateau fractures. Operative treatment byposterior approach. Clin Orthoprelat res. 1995;(320):125-128.
7. Brunner A, Honigmann P, Horisberger M, Babst R. Open reduction and fixation of medial moore type II fractures of the tibial plateau by direct dorsal approach. Arch orthop traumasurg. 2009;129(9):1233-8.
8. Rasmussen DS. Tibial condylar fractures, Impairment of knee joint stability as an indication of surgical treatment. JBJS. 1973;55:1331.
9. Yoram A, Weil MD, Michael J, Gardner MD. Posteromedial supine approach for reduction and fixation of medial and bicondylar tibial plateau fractures. J orthop Trauma. 2008;22:357-362.
10. Higgins TF, Kemper D, Klatt J. Incidence and morphology of posteromedial fragment in bicondylar tibial plateau fractures. J orthop Trauma. 2009;23(1):45-51.

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