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Original Research Paper

Orthopedics

OPERATIVE RESULTS OF INTRA ARTICULAR FRACTURES OF PROXIMAL TIBIA IN ADULTS

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ABSTRACT

Objective: The aim of our study was to evaluate the functional outcome of intraarticular tibia fractures.

Material and methods: 55 adult patients having closed fracture were followed up for a minimum period of 12 months. Mean age was 40 years and 85% male and 15% female. Road traffic accident was most common mode of injury. Most of our patients were labourer. Average time interval from injury to operation was 3-4 days. After proper pre operative planning open reduction and internal fixation was done using tibial locking plate. Average time of partial weight bearing was 10 weeks and full weight beariung was 12 weeks. Average time of fracture union in our study is 12.07 weeks.

Results: average knee flexion 134 degree and knee extention was 2.27 degree. Radiologically medial tibial plateu angle was 86.3 degree and posterior slope was 6.94 degree. Functional outcome according to tegner lysholm score system shows 76 % execellent and 18% of good outcome.

KEYWORDS :

INTRODUCTION:

Proximal tibia involvement is one of the most common intra articular fracture and difficult to manage. This fractures result from strong varus/valgus forces with or without axial loading. Fractures range from simple lateral condyle fracture to severe comminuted metaphyseal fractures[1]. Complex biomechanics of its weight bearing position and complex ligamentous stability and articular congruency are the main reason why these fractures are of concern to surgeon.

In current scenario new surgical techniques, various fixation methods and implant, surgical management is mainstay treatment for these complex fractures. Open reduction and stable internal fixation helps in maintaining the articular surface anatomy, repair of soft tissue injury, rigid internal fixation, and restoration of the mechanical alignment and stable knee joint which allows early mobilization of knee with full range of movement[2].

We have studied 55cases of proximal tibia intra-articular fractures and operative functional outcome at our institute.

MATERIAL AND METHOD:

In this series, 70 cases of proximal tibia intra-articular fractures were treated in our institute, 15 patients were excluded from study due to lost to follow up. So 55 adult patients having closed fracture were followed up for a minimum period of 12 months.

Primary management: All patients were managed according to ATLS protocol to start with. Hemo-dynamically stabilized, thoroughly examined for other major associated injury in head, thorax, abdomen or spine along with local limb examination including distal neurovascular status. Prophylactic doses of Tetanus Toxoid and antibiotics were given.

The limb was immobilized by above knee slab and elevation with or without ST pin insertion. Radiological investigations were done. X ray and C T scan done to know the Extent and dimension of fracture degree of comminution and extent of articular depression. Line of treatment was decided according to the type of fracture, degree of displacement and depression, and general condition of the patient.

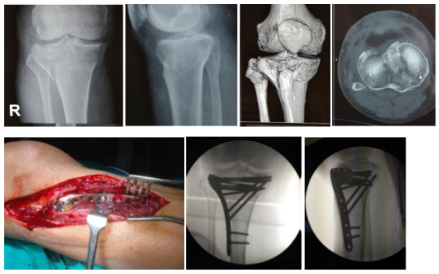
Surgical indication[3]:

- Fracture of lateral condyle Tibia. lateral tilting of plateau >5° step off > 3mm Condylar widening > 5mm
- Fracture of medial Condyle Tibia except fissures
- Articular depression > 4 mm
- Lateral tilted bicondylar Fracture
- When medial condyle is undisplaced see criteria for lateral condyle.
- When medial Condyle is displaced, operation is always recommended
- Metaphyseal-diaphyseal translation of >1 cm
- Medially tilted bicondylar Fracture
- Angular deformity of >10° in the coronal (varus-valgus) or sagittal plane
- Open fracture
- Associated compartment syndrome
- Associated ligament injury requiring repair.

The approaches used commonly are:

1] anterolateral approach
2] medial approach
3] postero medial approach
4] postero lateral approach

One of our case has been shown below:



POST OPERATIVE CARE:-

Above knee slab or removable knee brace with leg elevation is given to reduce the pain and oedema. Static knee quadriceps exercise and ankle toe mobilisation exercise is started on second day. The patients with stable fixation were allowed intermittent knee mobilization once the pain subside on CPM machine to achieve flexion up to 90 degree as early (within 3 to 7 days) depending upon comminution of fracture and fixation. Stitches are removed at round 2 weeks and progressive muscle strengthening exercises along with passive exercises instituted. Non weight bearing walker walking was allowed after 2 to 3 days.

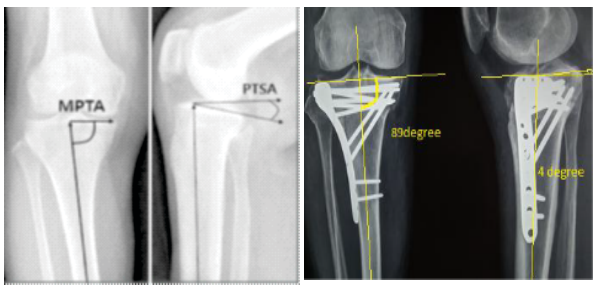
FOLLOW UP PROTOCOL:

The patient was followed up at the interval off 1,3,6,9,12 month and then 2 years. Full range of motion is expected at 8-10 weeks after discharge.

Weight bearing: Non weight bearing continued for approximately 10-12 weeks.Partial weight bearing was started from 10- 14 weeks depending upon the fracture configuration and correlation with the x-ray.Complete weight bearing was started after 14-16 weeks.

The course of healing was documented radiologically (AP and lateral) and clinically.

- Complete healing was defined as follows: radiologically complete bone regeneration at the fracture site and a patient capable of pain-free, full weight bearing on the injured limb.



- The angular deformity was measured radiologically and use of goniometer by comparative x-ray of normal limb.
- Angle in a varus and valgus direction as measured on the AP projection perpendicular to the long axis of the tibia. Normal medial tibia plateau angle range from 85 to 90 degree.
- tibia plateau makes the angle with a line perpendicular to the long axis of the tibia on lateral projection. Normal posterior slope range from 50 to 150.
- Final Assessment done with Tegner Lysholm knee functional score[4] and Rasmussen clinical functional score[5].

RESULTS:

In our study there were 85% of male and 15% of female patients with a mean age of 40 (21 – 70 years). The high incidence of fracture associated due to motor vehicle accident which accounts for (63%).Average time interval of injury and operation in our study is 3- 4 days. High incidence of fractures seen in occupation involved high level activity like labourer (45%) and employees (36%) which is around (81%).

Average time of knee mobilization was 5.5 days. Average time for partial weight bearing was 10 weeks and full weight bearing without support was 12 weeks.

Average time of fracture union in our study is 12.07 weeks. One patient had longer time of union (16 weeks) due to early deep wound infection.

We used AO classification for this fracture. 4 1 B 1.1 (9 Patients), B 1.2 (3 Patients), B 1.3 (8 Patients), B2.1 (1 Patient), B2.2(1 Patient),B2.3(1 Patient), B3.1(7 Patients), B 3.2 (0 Patients), B 3.3(1 Patients). 4 1 C 1 (13 Patients), C 2(10 Patients) And C 3(1 Patient).

Early wound infection was present in 2 cases which were treated with antibiotic coverage debridement. One patient had late infection in form of osteomyelitis treated with implant removal, wound debridement and long term antibiotics.

Average knee flexion at final follow up was 134 degree(normal range 10-140). Average knee extension was 2.27 degree. One patient had knee stiffness with 60 to 110 degree range of movement.

Average medial tibial platue angle was 86.3 degrees(normal side 87.7). Average posterior tibial slope was 6.94 degrees (normal side 7.25).

Functional out come according to tegner lysholm score system[4] is 76 % excellent and 18 % good results are achieved. 2 pateints had fair and 1 patient had poor outcome.

DISCUSSION:

Proximal tibia intra-articular fractures, one of the most common intra articular fractures, are major traumatic injuries occurring as result of motor vehicle accident, fall from height, domestic fall etc. and sometime associated with other bony injuries. Treatment strategies and specific indications for surgery of tibia intra-articular fractures continue to be different.

Rademakers et al[6] in 2006 study shows that motor vehicle accident was account for 39% of fractures which accounts for 69% of type B fractures and 31% of type c fractures compare to Our study which shows increasing in numbers 63% with 56.3% type B fractures and 43.61% type C fractures. This suggests that MVA is the major cause and emerging factor now a day for this type of fractures due to increase numbers of population and vehicles. We found that type of high velocity injury predisposed to severity of comminution is also increasing.

Rademakers et al[6] found the mean functional range of motion was 1300 with 5.4% of infection rate and 5% patients had nonunion of fracture at final follow up. F. biggi et al[9] had studied internal fixation with locking plates and MIPO technique for tibia fractures in 44 patients with excellent functional outcome. Mean age was 43 years with Wound complication was 9.09 %. In Mardian et al[8] study they found 6% of complication rate with good functional outcome. In our study wound complications were less (3.63%) in compare to other studies with average range of functional movements of 1340. This suggest improvements in surgical techniques, proper timing of surgery and precise tissue handling with minimization in implantation, and sterilization are key points in lessening the infection rate.

Acceptable functional result of different study are shown below

F. biggi et al. 2012	94%
Mardian et al.2015	73.3%
Jain et al 2016.	84%
Our study	94.56%

In this series we achieved final outcome with satisfactory result of 94.56% (excellent 76.38% and good 18.18%) according to Tegner lysholm and Rasmussen functional scoring system. Overall complication rate was 14.52% which involves the early- late infection, and knee stiffness. No significant angular deformity was noted in our study.

We believe that future studies with better randomization with similar fracture pattern are needed to better understand the fixation techniques and possible strategies aimed at reducing and avoiding adverse events it the treatment of proximal tibia intra-articular fracture.

REFERENCES:

1. Watson JJ and Wiss AD. Rockwood and Green,s fractures in adults: fractures

of the proximal tibia and fibula. Bucholz RW and Heckman JD edi. 8TH Philadelphia: Li-pincott Williams and Wilkins;2001;2:1799-1839
2. Yu Z, Zhang Y , Li J, Ma B. functional and radiological evaluation oh high energy tibial plateau fractures treated with double buttress plate fixation. Eur J Med Res. 2009;14(5):200-05
3. Prat-Fabregat S, Camacho- Carrasco P. Treatment stratergy for tibial plateau fractures: an update. EFORT Open Rev 2016,1:225-232.
4. Tegner Y and Lysholm J: Rating systems in the evaluation of knee ligament injuries. Clin Orthop Relat Res: 43-49, 1985.
5. Rasmussen PS. Tibial condylar fractures. Impairment of knee joint stability as an indication for surgical treatment. J Bone Joint Surg Am. 1973;55:1331-50.
6. Rademakers MV, Kerkhoffs GM, Sierevelt IN, Raaymakers EL, Marti RK. Operative treatment of 109 tibial plateau fractures: five-to 27-year followup results. J Orthop Trauma. 2007;21:5-10.
7. Jain RK, Shukla R, Baxi M, Agarwal U, Yadav S. Evaluation of functional outcome of tibial plateau fractures managed by different surgical modalities.Int J Res Orthop. 2016 Mar 21;2(1):5-12.
8. Märdian S, Landmann F, Wichlas F, Haas NP, Schaser KD, Schwabe P. Outcome of angular stable locking plate fixation of tibial plateau fractures Midterm results in 101 patients. Indian J Orthop 2015; 49: 620-9.
9. Biggi F, Di Fabio S, D'Antimo C, Trevisani S. Tibial plateau fractures: internal fixation with locking plates and the MIPO technique.
10. Tegner Y and Lysholm J: Rating systems in the evaluation of knee ligament injuries. Clin Orthop Relat Res: 43-49, 1985.