



EVALUATING FUNCTIONAL OUTCOME OF THE MIPPO TECHNIQUE IN PROXIMAL TIBIA FRACTURE; A PROSPECTIVE STUDY

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ABSTRACT

Introduction- The proximal tibia fractures accounts for 5-11% of all tibia fractures. The goal of proximal tibia fracture treatment is to obtain early union of fracture in the most acceptable anatomical position with early and maximum functional return of activity. **Aim-** The aim of our study was to evaluate the result of proximal tibial fractures with minimal invasive percutaneous plate osteosynthesis. **Material and method-** This prospective study was conducted from June 2020 to Dec 2021 in Department of orthopaedics, NSCB Medical College, Jabalpur M.P. Patients between 18-55 years of age, with closed, displaced extra and intra-articular proximal tibial fractures up to Grade-2 open fracture were included. **Results-** This study included 30 patients with the fracture proximal tibia in which 10 patients of open fracture upto grade 2 and 20 patients of close fracture, were treated with closed reduction and internal fixation with MIPPO technique. There were 23 males and 7 females. 26 cases were caused by Road traffic accidents (RTA), two cases of domestic fall, two cases of physical assault. The mean operative time was 72.6 minutes (55-90 minutes). Average time for union was 15.4 weeks (range of 12-22 weeks). Out of 30, 4 patients had postop complication such as infection, wound dehiscence and loss of motion. **Conclusion-** MIPPO technique offers a good treatment option for the proximal tibia fractures. It provides a fast and good functional recovery so that patient can get back to their normal life as soon as possible.

KEYWORDS : Proximal Tibia, MIPPO, Osteosynthesis, indirect reduction

INTRODUCTION

The proximal tibia fractures accounts for 5-11% of all tibia fractures. Fractures of the proximal tibia can be difficult to manage and are associated with a wide range of severity that can exist from stable non-displaced fractures with minimal soft-tissue damage to highly comminuted unstable fractures and severe soft-tissue damage and are generally classified into two broad categories, high energy fractures and low fractures. It includes extra and intra-articular fracture. In intraarticular fracture, 55-70% injury affect lateral condyle. Isolated injuries to the medial condyle occur in 10-23% cases; whereas bicondylar fractures are seen in 10-30% cases¹. Classification for these fractures includes AO and Schatzkar classification system². The goal of proximal tibial fracture treatment is to obtain early union of fracture in the most acceptable anatomical position with early and maximum functional return of activity. Treatment option for fractures of tibia are closed reduction and cast application, closed reduction and external fixation, closed reduction and internal fixation with minimally invasive percutaneous plate Osteosynthesis technique and open reduction and internal fixation with plate. Rhinelander³ believed that blood supply is the most important factor in normal bone healing. So the concept of management of these fractures has been changed from absolute fixation to relative fixation of biological osteosynthesis with preservation of osseous and soft tissue vascularity. Biological plating provides relative stability and preserves vascularity around the fractures. The principles of this minimally invasive technique include indirect closed reduction, extraperiosteal dissection and relative stability which allows limited controlled motion at fracture site.

The aim of our study was to evaluate the result of proximal tibial fractures with minimal invasive percutaneous plate osteosynthesis and to assess the clinical, radiological and functional outcome of the same.

MATERIALS AND METHODS:

This prospective study was conducted from June 2020 to Dec 2021 in Department of orthopaedics, NSCB Medical College, Jabalpur M.P. This study included 30 patients with fracture

proximal tibia and age of patient ranging from 18 to 55 years. Fractures were classified using AO classification and Schatzkar classification². In this patients with closed, widely displaced extra and intra-articular proximal tibia fractures up to compound grade 2 were included.

Exclusion Criteria-

1. Patients with open fractures more than Gustillo and Anderson's grade 2
2. Compartment syndrome or impending compartment Syndrome
3. Poor skin condition/skin disorders

A complete thorough examination of the affected limb was done. Special attention was given to assess the neurovascular status of the limb. Immediate posterior splinting of the limb was done with plaster of Paris slab. The necessary xrays (AP/Lat/Oblique) were obtained and evaluated. After written informed consent, the patients were placed in supine position and operated under spinal anaesthesia. Static quadriceps exercises with knee and ankle range of movement exercises were started the day following surgery. Postoperative radiographs were done on the day following Surgery. Non-weight bearing ambulation was started on the second post-operative day. Partial weight bearing ambulation was started from six weeks and full weight bearing after 12 weeks when sufficient callus was seen on radiograph. Patients were regularly followed for assessment of pain at fracture site, tenderness, range of movement at knee and ankle, condition of operated site and radiological union at postop day1, 2,6,12,20 weeks and 6 months. Bony and functional results were classified into four categories ranging from excellent to poor according to SJLAM criteria⁴.

RESULTS;

In our study, 30 patients of proximal tibia fractures in which 10 patients of open fracture upto grade 2 and 20 patients of closed fracture, were treated with closed reduction and internal fixation with MIPPO technique. There were 23 males and 7 females, between age from 18 to 55 years with a mean age of 38.03 years. The site of involvement were more on

right(17)> left(13) side. 26 cases were caused by RTA, two cases of domestic fall, two cases of physical assault. Majority of the patients were operated within the first week of injury (66%), mean time from trauma to surgery was seven days. The mean operative time was 72.6 minutes (55-90 minutes). Mean time for radiological union was 14 weeks (14-22 weeks). Out of 30, 4 patients had post-op complication such as infection, wound breakdown and loss of motion. All patients were followed up for minimum of one year.

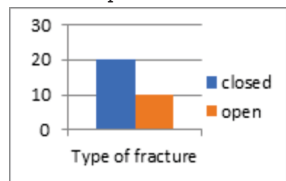


Figure 1

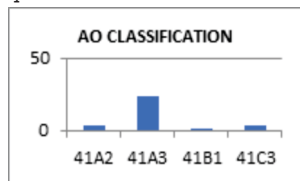


Figure 2

Table 1:

Range of movement after 6 month follow up	No. Of patients	Percentage
100-120	6	20%
121-140	17	56.6%
> 140	7	23.3%

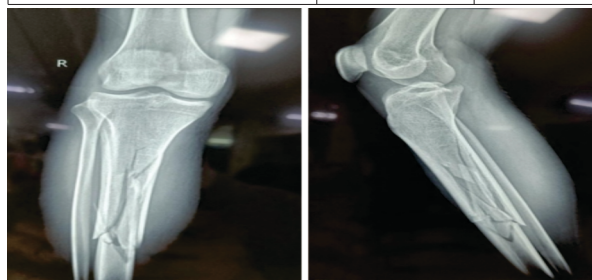


Figure 3: Pre-op xray



Figure 4: post-op day 1 xray

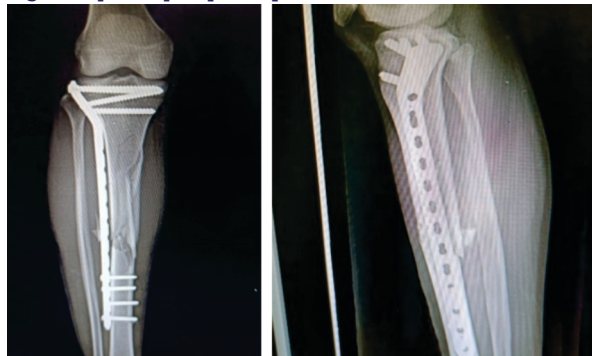


Figure 5: Post-op 1 month xray

DISCUSSION:

The fractures of the proximal tibia are high energy injuries. The results of the treatment of these injuries have been poor with loss of motion, wound breakdown, and infection as final outcomes^{3,5}.

In the present study, 30 patients were treated with MIPPO technique for proximal tibia fractures. Out of 30 patients 23 (76.7%) were male and 7 (23.3%) were female. Comparable to study done by Krettek et al⁶ and Koval et al⁷.

The range of age varies from 18-55 with mean age was 38.03 years. Maximum numbers of patients were from the age group between 31 and 45 years. This age group are more vulnerable to RTA. Comparable to study done by Joon-woo kim et al⁸.

The mode of injury was RTA in 24 (80 %) cases followed by fall in 2 (13.3%) and 2 case (6.7%) of assault. Monappa et al⁹ described that RTA is common mode of injury, comparable with our study.

In our study, 26 patients were of AO type A, 1 were AO type B and 2 were of AO type c fracture. Out of 30 patients, 66.7% (20) were closed and 33.3%(10) was of compound grade I and II. These are similar to studies by Oh et al¹⁰ who observed in 23 fractures, there were 13 type A, 5 were type B and 5 type C out of 23 fractures. There were four open fractures (grade I- 3, grade III A-1 case).

The advantage of locking plate are that the plate can be used in patients with diminished bone quality and better angular stability. Gonzalez et al¹¹ also described that plate can be used with severe soft tissue damage as the plates are considered to preserve the periosteal blood supply so need for bone grafting less.

No meniscal or ligamentous injuries were clinically diagnosed after 6month follow up in our study. Moore et al¹² found no difference in laxity between the injured and the non-injured knees of 208 patients at least 1 year after the fracture.

The average time for union was 15.4 weeks (range of 12-22 weeks), although 10/30 patients had radiological union at 14 weeks. Raiturker and Salunkhe¹³ and Singh et al¹⁴ had a union in a range of 16-20 weeks, 21 weeks respectively.

In the present study, the range of knee flexion was 110-150 degrees, with a mean flexion of 135 degrees which is comparable with the other studies by Krettek⁶ and Kankate et al¹⁵ in which they observed 136, >130 degrees of knee flexion respectively at final follow up.

In our study, all the fractures acceptable reduction. The excellent success rate was achieved due to indirect or closed reduction of fracture without disturbing fracture hematoma.

CONCLUSION;

MIPPO technique offers a good treatment option for the proximal tibia fractures. It provides a fast and good functional recovery so that patient can get back to their normal life as soon as possible. The limitations in our study were the small size.

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