

**Original Research Study**

## **Outcome Of Proximal Femoral Nailing In Subtrochanteric Fracture Of Femur In Adults**

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### **ABSTRACT:**

**Introduction:** Subtrochanteric fractures typically occur in the proximal femur between the inferior aspect of the lesser trochanter and a distance of about 5 cm distally, however, it progress into the intertrochanteric region generally in most cases. The deforming forces on both the proximal and distal segments are difficult to control because of muscle insertion to the proximal and distal fragments. This study is intended to assess the efficacy of Proximal Femoral Nailing in the treatment of subtrochanteric fracture.

**Material and Methods:** patients admitted in orthopedic ward during emergency and visiting the orthopedic OPD. Total of 45 cases satisfying the inclusion criteria, all closed fractures and open Grade 1 and 2 fractures according to Gustilo–Anderson classification were included. All patients were evaluated with respect to history, vital parameter, general condition and mode of injury. Were checked and recorded. Radiological, hematological and biochemical investigations were done. All surgical protocols were followed. Regular follow up of every patient was carried out until union. Clinical and radiological evaluation done.

**Results:** In the present study of 45 patients, the mean age was Mean age in years=64.04. Youngest patient was 21 years while oldest is 81years and Domestic fall had the cases of 85.24% followed by road traffic accidents 14.76%. Average time for union was 17.6 weeks (4.42 month). In 2 (4.44%) patients, there was postoperative infection 3 (6.66%) and 3 (6.66%) patients had broken implant and 1 (2.22%) patient had nonunion. Patients with blood hemoglobin values between 8 to 10 and less than 8, required blood transfusion perioperatively Mean Harris hip score were 77.6. Excellent to good results are seen in 56% of patients, 66% patient's shows fair to good results.

**Conclusion:** In conclusion PFN is a good implant for subtrochanteric fracture of the femur. The advantages includes smaller exposure, lesser blood loss, closed technique, shorter operative time, less morbidity, with mechanical advantages of rotational stability and possibility of dynamic or static distal locking. Fracture united in 98.3% cases and postoperative functional outcome was good. Surgical technique is complex and with stiff learning curve. The number of complications was acceptable and comparable with other fracture fixation system.

**Key words:** Pertrochanteric, Subtrochanteric, Proximal Femoral Nailing, proximal femur

## **INTRODUCTION:**

Subtrochanteric fractures typically occur in the proximal femur between the inferior aspect of the lesser trochanter and a distance of about 5 cm distally.<sup>1</sup> They account for approximately 10%–30% of peri-trochanteric fracture<sup>2-3</sup>. Pertrochanteric femoral fracture in younger population occurs due to high velocity trauma whereas in advanced age individual occurs due to spontaneous fall<sup>4</sup>. Most of pertrochanteric fractures are unstable and bear a high failure rate. This instability is multifactorial and includes loss of posteromedial calcar support and loss of posterolateral support or lateral wall insufficiency<sup>5</sup> For a fracture to occur, four conditions must be met. First, the orientation of the faller should lead to an impact at or near the trochanter. Second, the protective responses of the patient, such as grabbing for a supportive object or extending the arms to reduce the energy of the fall, are inadequate. Third, local soft tissues around the hip are unable to dissipate energy adequately, and fourth, the bone strength is less than that necessary to withstand the residual energy imparted. . If balance is lost, she or he will tend to collapse to the side, which affects the hip directly. These factors have made subtrochanteric fractures a special consideration in orthopedic trauma because defective union of this fracture can lead to high disability for an individual. The proximal fragment is deformed by hip flexors and abductors making reduction of the fracture difficult. In spite of great advances made in the field of trauma in the last 50 years, the management of this fracture has always remained a subject of debate. The evolution of Proximal Femoral Nail by AO-ASIF in 1997, for various types of upper femoral fractures, claims to give superior results than other techniques. The aim of this study was to assess the outcomes of Proximal Femoral Nailing (PFN) for the treatment of subtrochanteric fractures of femur.

## **MATERIALS AND METHODS:**

A prospective study conducted assess the outcomes of Proximal Femoral Nailing (PFN) for the treatment of subtrochanteric fractures of femur. Patients admitted in orthopedic ward during emergency and visiting the orthopedic OPD. Total of 45 cases satisfying the inclusion criteria, all closed fractures and open Grade 1 and 2 fractures according to Gustilo–Anderson classification were included. Skeletally immature patients, A compound fracture 3, A pathological fracture, Associated head injury (Glasgow coma scale <12), Active infection at operative site, Medical contraindication to surgery or anaesthesia. And Ipsilateral fracture shaft femur, tibial fracture and injuries around the knee were excluded. Operative procedure: All patient were positioned supine on fracture table following anaesthesia. Closed manipulation and reduction of fracture performed under image intensifier control. Extremity has been secured in the traction foot piece,traction is exerted longitudinally, The limb is 5 to 10 deg. internally rotated in order to reduce the fracture, Heel toe relation was maintained.Draping of the patient and image intensifier in the standard manner. Incision: A straight lateral incision was made from tip of the greater trochanter, extending 4-6 cm proximally. Gluteus maximus muscle was dissected in line with its fibers. The entry portal for the PFN was made using an awl at the tip of the greater trochanter, halfway between its anterior and posterior extent. Depending on the type of fracture, distal interlocking either statically or dynamically was achieved via the same aiming arm . The stability of the construct was assessed. Wounds were closed in layers over negative suction drain. Antiseptic dressing was done. Limb elevation was given on Bohler frame to reduce swelling and facilitate drainage.IV antibiotics in the form of third generation cephalosporins ,amino glycosides were given. Oral antibiotics started from the fifth post op day continued till suture removal. Analgesics given for a period of 5 days. Drain removal after 48 hrs. Patients were discharged and were recalled for suture removal after 10 to 12 days. Patients were advised non weight bearing walker walking after suture removal. Partial weight-bearing walker walking was started around 6–10 weeks and full-weight-bearing walker walking was allowed usually between 10 and 14 weeks after assessing for radiological and clinical union. The functional evaluation of the results was done with the help of Harris hip score.

**RESULTS:**

In the present study of 45 patients, the mean age was Mean age in years=64.04. Youngest patient was 21 years while oldest is 81years and Domestic fall had the cases of 85.24% followed by road traffic accidents 14.76%.. This suggests that the majority of patients had subtrochanteric fracture as a result of high-velocity trauma. According to type of subtrochanteric fracture.(Seinsheimer classification)(Table1). 10 (83.3%) were as type 1 zero cases and type 3, type 4 accounted for only 01 patients each. . The operating time for 96 % cases was between 1 to 2 hours. Most of the patients were advised partial weight-bearing in the form of walker walking between 6 and 10 weeks with average time around 9 weeks. Patients were advised full weight-bearing walking with walker between 10 and 14 weeks with average time around 12 weeks. ). Average time for union was 17.6 weeks (4.42 month). In 2 (4.44%) patients, there was postoperative infection 3 (6.66%) and 3 (6.66%) Patients had broken implant and 1 (2.22%) patient had nonunion. Patients with blood hemoglobin values between 8 to 10 and less than 8, required blood transfusion perioperatively Mean Harris hip score were 77.6. Excellent to good results are seen in 56% of patients, 66% patient’s shows fair to good results. which suggest that intramedullary fixation of subtrochanteric femur fracture treated with PFN provides good results. (Table 2).

Table1- According to type of subtrochanteric fracture. (Seinsheimer classification)

Type of fracture	Percentage.
Type 1	00
Type 2	83.3%
Type 3	8.3%
Type 4	8.3%
Type 5	00

Table2- Functional evaluation Harris hip score

Harris Hip Score	Interpetation	Percentage
90 to 100	Excellent	21.6%
80 to 90	Good	35%
70 to 80	Fair	31.6%
70 to 60	Poor	6.6%
Below 60	Failed	5%

**DISCUSSION:**

The discussion about the ideal implant for treatment of subtrochanteric fractures continues. Operative treatment in the form of internal fixation permits early rehabilitation and offers the best chance of functional recovery, and hence has become the treatment of choice for virtually all fractures in the trochanteric region. In this study an attempt was made to evaluate success in the management of subtrochanteric fractures using proximal femoral nail (PFN). PFN is an effective intramedullary load-sharing device. The advantages of PFN are minimal blood loss, shorter operative time, and early weight-bearing. In comparison with intertrochanteric fractures, subtrochanteric fractures are generally associated with slightly higher failure rates.

In most of our patients domestic fall (fall at home) and trivial trauma was main reason behind fracture. there were no case of assault. This may be attributed to the following factors as enumerated by Cummings and Nevitt;<sup>6</sup> Keneth J. Koval and Joseph D. Zuckerman observed that 90% of hip fractures in the elderly results from a simple fall. Hip fractures in young adults were observed to result most often with high energy trauma such as motor vehicular accidents or a fall from height.<sup>7</sup> The most common type was Seinsheimer’s Type II followed by Type III and type IV.which is comparable with a study by Zhou, *et al*<sup>8</sup>. In Indian population average diameter of medullary canal is found to between 9-10 mm.<sup>9</sup> In our study average diameter of nail used was 9.4mm. The average union time in our study is in comparable to Boldin *et al*.<sup>10</sup> the soft tissue dissection is much less than extramedullary

fixation the amount of blood loss during PFN was less as compared to extramedullary fixation.<sup>11</sup> There was 1 nonunion in our study. Nonunion rate of 28% Rahme *et al.*,<sup>12</sup> 10% and Yolmaz *et al.*<sup>13</sup> for Angled plate have been reported. Excellent to good results are seen in 56% of patients, 66% patient's shows fair to good results. which suggest that intramedullary fixation of subtrochanteric femur fracture treated with PFN provides good results in similar with study by Zhou, *et al.*,<sup>8</sup> have reported 96.05% excellent-to-good result and 3.95% patients have fair-to-poor results. Functional outcome for elderly patient with unstable intertrochanteric fracture is difficult to assess and depends on many factors in addition to fracture care. Successful fracture care does not always correlate with a successful outcome<sup>14,15</sup>

### CONCLUSION:

In conclusion PFN is a good implant for subtrochanteric fracture of the femur. The advantages includes smaller exposure, lesser blood loss, closed technique, shorter operative time, less morbidity, with mechanical advantages of rotational stability and possibility of dynamic or static distal locking. Proximal and distal bolts passed through femoral nail gives good axial and rotational stability and prevent shortening and malunion. Procedure is technically demanding with difficulty in early cases but gradually with learning and improvement in technique complications can be avoided.

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