

Clinical Outcome of Proximal Femoral Fractures Fixed With Proximal Femoral Nail

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Abstract: Proximal femur fractures are commonly seen in Road Traffic Accident (RTA) and in domestic fall. These fractures behave differently during reduction because of various muscular attachments and difficult to fix.

Aim: To evaluate the clinical outcome of proximal femoral fractures fixed with Proximal Femoral Nail (PFN)

Materials and Methods: It is a prospective study carried out in our Department of Orthopaedics from Jan 2016 to Jan 2017. Total 15 cases were treated of which 6 were Intertrochanteric fractures and 9 were Subtrochanteric fractures. All the fractures were fixed with Long PFN under fluoroscopic guidance by closed methods. Patients were followed up at 1,2,3, 6 months.

Results: All the patients were assessed clinically with Harris Hip score and radiologically with X rays. Of the 15 patients 11 cases went for union, 2 cases went for delayed union and 2 cases of non-union were reported. Out of 11 cases went for union 1 case went for varus deformity, 1 case of shortening was observed. In our study excellent result noted in 60 % of cases, good result in 20 % of cases, fair in 7 % of cases and poor in 13 cases

Conclusion: Our study suggest that PFN is a stable implant allows early mobilization, less tissue trauma, less operative time, less blood loss, preserving the fracture haematoma thereby helping the fracture to consolidate early, no thigh pain due to longer nail thereby improving the functional outcome of these proximal femoral fractures.

Keywords: Inter trochanteric fracture, Proximal femoral nail, Road traffic accident, Subtrochanteric fracture

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I. Introduction

Proximal femur fractures includes intertrochanteric fractures and sub trochanteric fractures. They are commonly seen in Road Traffic Accident (RTA) and in domestic fall. These fractures behave differently during reduction because of various muscular attachments and difficult to fix⁽¹⁾. Proximal femoral fractures occurring in young individuals are due to high energy trauma whereas in older individuals are due to osteoporosis⁽²⁾. We used Boyd and Griffin classification for inter trochanteric fractures and Seinsheimer classification for sub trochanteric fractures. Proximal femoral fractures fixed with Proximal Femoral Nail (PFN) uses two lag screws that gives rotational stability than with Dynamic Hip System (DHS) / Dynamic Condylar Screw System (DCS)⁽³⁾. In our study we treated the Proximal femoral fractures with long PFN by closed methods which minimises the blood loss, infection and aids in faster healing of fracture⁽⁴⁾. Hence the current study was focused on effect of PFN in Proximal femoral fixation on clinical and radiological outcomes.

II. Materials & Methods:

The prospective study was carried out in the Department of Orthopaedic, at a teaching and research hospital at Thanjavur, India from January 2016 to January 2017. In the current study, 15 consecutive patients with isolated proximal femoral fractures were recruited, which include 6 patients with intertrochanteric fractures and 9 patients with Subtrochanteric fractures. These patients were treated with long PFN of which 8 patients were RTA victims and 7 of them had a domestic fall. There were 9 males and 6 females in the study. Patients with ipsilateral femoral neck, shaft fractures, open and pathological fractures were excluded in this study. All patients were assessed for outcome both clinically and radiologically with X rays.

Surgical Technique:

Patients were taken up for surgery after anaesthetist fitness. Under spinal anaesthesia with Preoperative IV antibiotic coverage, patient was positioned on fracture table and the fracture was reduced under "C" arm control both in AP and Lateral projections. A 5 cm incision made proximal to greater trochanter, entry point made at the tip of trochanter or just medial to the trochanter. Guide wire was passed and reamed and a suitable size PFN was passed and fixed with 2 lag screws proximally and a distal locking screw. IV antibiotics were

continued for 2 days and oral antibiotics for 2 more days. Thromboembolic prophylaxis were given in the post operative period. Quadriceps exercises were taught to all patients. Suture removal was done at 2 weeks. Patients were followed at 1, 2, 3, and 6 months. Non weight bearing mobilization was started as tolerated by the patient and the full weight bearing is allowed after clinical and radiological assessment which was around 8 – 12 weeks. Clinical assessment with Harris hip score and radiological assessment with X rays done in the follow up period.

Table 1. Fracture distribution

Fracture Types	Number of patients (%)
Intertrochanteric fractures	6 (40)
Subtrochanteric fracture	9 (60)

III. Result

There were 9 men which accounts for 60 % and 6 women which accounts for 40% of cases in this study with an average age of 46.5 years. Patients were followed up with X rays for a minimum of 6 months and maximum of 1 year period. The mean follow up was 9 months. At the end of the follow-up period fracture union was achieved in 13 (86.7%) patients of which 2 (13.3%) cases of delayed union were reported. We encountered 2 cases of non-union for which iliac crest bone grafting done which went for union, 1 case of superficial infection, 1 case of trochanteric bursitis. Minimal limp was noted in 3 patient.



Fig 1. X ray image showing Intertrochanteric fracture fixation



Fig 1a. Post-op X-ray image showing PFN



Fig 2. X ray image showing subtrochanteric fracture.



Fig 2a. Post-op Xray showing PFN fixation



Fig 3. X ray image showing Subtrochanteric fracture



Fig 3a. Post-op X ray showing PFN fixation

IV. Discussion

Proximal femoral fractures treated with DHS / DCS carries a high rate of failure because of posteromedial comminution, extensive periosteal stripping, loss of fracture haematoma, screw cut out, being a load bearing implant leading to fatigue failure of implant. PFN achieves biological fracture fixation with preservation of fracture haematoma, less tissue trauma, being a load sharing implant with good stability and rotational control, which aids in the union of fracture. All the intertrochanteric fractures healed well. 2 cases of delayed union and 2 cases of non-union⁽⁵⁾ were reported in subtrochanteric fractures which on iliac crest bone grafting went for union.

Table 2. Outcome Results based on Harris Hip Score

Result	Number of patients (%)
Excellent	9 (60)
Good	3 (20)
Fair	1 (7)
Poor	2 (13)

The blood loss during the PFN surgery is less due to less soft tissue damage⁽⁶⁾ and shorter operation time⁽⁷⁾ when compared to open DHS/ DCS surgery as the fracture is fixed by closed methods. The average union time of fracture in our study is 3.5 months. In our study we got 60 % excellent result, 20 % good result, 7 % fair result, 13 % poor result as per Harris hip score. Thus PFN allows early mobilization, early union leading to weight bearing, early return to work, with low reoperation rates.

V. Conclusion

The clinical outcome of proximal femoral fractures treated with long PFN gives predictable results having Biological and Biomechanical advantage of intra-medullary location of the implant with high union rate⁽⁸⁾ although a technically demanding procedure which needs a long learning curve.

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