



Analysis of Results of Proximal Femur Nailing in Peritrochanteric Femur Fracture in Adults

Dr. Pankaj Sharma M.S.orthopedics, Department of orthopedics, V.S.Hospital

Dr. Ankit Chaudhri M.S.orthopedics, Department of orthopedics, V.S.Hospital

Dr. Vatsal Khetan 2nd Year resident, Department of orthopedics, V.S.Hospital

Dr. Tarkik Amin M.S.orthopedics, Assistant Professor, Department of orthopedics, V.S.Hospital

ABSTRACT

Peritrochanteric femur fracture are usually sustained from a fall or road traffic accident. Reduction and Internal fixation is an alternative due to frequent development of non-union, increase in morbidity and related complications.

MATERIALS AND METHODS: In this prospective study of 83 patients with peritrochanteric femur fracture operated with proximal femur nailing were enrolled.

RESULTS: Results were considered in terms of complication ,mobility and Harris hip score.

CONCLUSION: Peritrochanteric femur fracture operated with Proximal femur nailing yielded good overall results.we recommend operating peritrochanteric femur fracture with Proximal femur nail in adults as well as elderly.

KEYWORDS :

INTRODUCTION

Orthopaedic fraternity is always on the lookout for an effective and suitable method to treat the upper femoral fractures in the best possible way. In this process surgical management of these fractures and the surgical implants used have also gone through an array of changes in their procedures and designs. Various upper femoral devices like dynamic condylar screw, dynamic hip screw with barrel plate, etc. are being used by various centres and each centre claims reasonably satisfactory results with each type of device but no single technique has proved to give excellent results. 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 present study was conducted to assess the utility and effectiveness of Proximal Femoral Nailing for the treatment of various types of proximal femur fractures especially in the Indian scenario.

MATERIALS AND METHODS

We have done a prospective study of 83 fractures of Proximal femur fracture treated by PFN at our institute and they were followed up at regular interval with follow up of minimum six months

METHOD OF COLLECTION OF DATA

- By interview
- By follow up at intervals of 1, 2, 4 and 6 months
- By clinical examination
- By analysing case papers

Selection Criteria:

A: Inclusion criteria:

- All patient above 18 years including both sex
- All Closed fractures
- All open grade 1&2 fractures according to Gustilo & Anderson classification.

B: Exclusion Criteria:

- Patients <18 years
- All open grade 3 Fractures as per Gustilo and Anderson classification
- Associated vascular injury or Compartment Syndrome
- Pathological Fracture

OPERATIVE PROCEDURE

All patients were treated with intramedullary fixation using Proximal femur nail.



Fig.: Operating table and position of patient

RESULTS, ANALYSIS AND DISCUSSION

All cases were treated with Intramedullary Fixation using "Proximal Femur Nail". The analysis of patient data, intraoperative data and post-operative outcome is as follows.

In young adults injury was caused by high velocity and in older age group, main cause is low velocity trauma. 50(60%) patients were male in this series. Right extremity was more involved. Most common cause of injury was RTA followed by Fall on ground. Overall 15 patients had associated injuries. 12 patients had associated injuries in form of fracture of shaft femur, distal end radius fracture, calcaneum fracture etc. 3 patients had other system injuries in form of Head injuries. 13 patients had hypertension and 7 had diabetes out of which 3 of them had both diabetes and hypertension. 1 patient had Carcinoma breast, asthma along with diabetes and hypertension and had to be admitted in ICU postoperatively. Out of other medical conditions Epilepsy, HIV, and heart disease were present with causal incidence of 1 each, whereas COPD was present in two patients.

42 patients have Intertrochanteric and 41 have Subtrochanteric femur fractures. Average time of surgery for PFN was 70.42 minutes. 21(25.3 %) patients were given blood transfusion. 17 patients had decreased preoperative Haemoglobin (as most of them were old patients with associated medical problem) and 4 of them were polytrauma patients who presented with hypotension.

The average radiological union time was 4.66 months, ranging from 3 months to 11 months. The average Full Weight Bearing walking time was 3.81 months ranging from 2 months to 6 months. The average Partial Weight Bearing was 2.27 months. 5 patients had non-union at the end of follow up.

In 3 patients with long spiral fracture, encirclage wiring was done by opening fracture site, to hold fragments. 57(68.67%) patients had normal limb length postoperatively.

2 patients had early post-operative infection which was resolved with antibiotics and dressing. 3 patients with screw backout were treated by inserting new screw of smaller size. One patient with back out nail with pre-existing comorbidities, developed fatal complications (DVT) and died. 2 patients had breakage of calcar screw but they did not agreed for any intervention but eventually progressed to union.

Based on Harris Hip Score:

Results	No. of Patients (%)
Excellent	49 (59.04)
Good	18 (21.89)
Fair	11 (13.25)
Poor	5 (6.02)



Fig.: Outcome of surgery based on Harris Hip Score
67(80%) patients had good to excellent results according to Harris Hip score.

In comparison with intertrochanteric fractures, subtrochanteric fractures are generally associated with slightly higher failure rates because the proximal fragment has the tendency to anteflex relative to the distal fragment, owing to psoas muscle activity, and shorter distance from locking screw hole to fracture. Non-surgical treatment of peritrochanteric fractures has no or little place due to the high rates of non-unions, malunions due to inability to control muscle

Forces pulling the fracture fragments in different directions, as well as the morbidity and even mortality associated with the prolonged immobilization.

We have studied 83 cases of peritrochanteric fracture of femur treated with proximal femur nailing.

High velocity trauma is found more commonly in subtrochanteric fractures.

AGE DISTRIBUTION IN DIFFERENT FRACTURE TYPES

TYPES OF FRACTURE	<50 YEARS	>50 YEARS
INTERTROCHANTERIC	11(26%)	31(74%)
SUBTROCHANTERIC	17(41.5%)	24(58.5%)

In both the fracture types , older age groups were more involved may be due to age related osteoporosis.

Reviewing the literature, it was seen in different series that the time taken for surgery was variable and dependent on number of factors like the type of fracture, bone structure of the patient, the skill of the operating surgeon etc. and not solely on the implant used.

Average duration of surgery in Intertrochanteric and subtrochanteric fracture is 63.2 minutes and 76.3 minutes respectively which is less than the time taken for extramedullary fixation. this is uniformly seen in most of the series.

Many of these fractures are due to high velocity trauma with associated injuries which also affected post-operative mobilization and weight bearing and thus the final outcome.

Though PFN is preferably done as a close surgery but if the reduction is not acceptable then an open reduction followed by PFN. In our series ,as and when needed we had resorted to open reduction.

The amount of blood loss during operation was less because the femoral head was not reamed and the fracture site was not exposed, unlike other intramedullary implants like Gamma nail or extra medullary implants such as DHS^{1,2}.

Associated co-morbid medical conditions like hypertension have ill effects on the final outcome of the patients. They caused an increase in the injury-operation time initially and longer rehabilitation thereafter³. On the contrary, patients who had no comorbid conditions had better functional outcomes.

COMPLICATIONS

We had 2 cases of infection of which only one was deep which were cured by antibiotics and dressing. Chances of postoperative infection in PFN are much less owing to small incisions, less surgical dissection.

There was Limb length discrepancy of <2cm in 26 patients which was compensated by pelvic tilt and the patients had no problem in walking.

There was 1 mortality in our study which was attributable to concomitant medical problems and the intramedullary nailing (PFN) did not appear to have contributed to patient's medical complication and death.

POSTOPERATIVE REHABILITATION AND DISCHARGE

Due to intramedullary fixation with proximal and distal locking with resultant small incision , the patients were more compliant in there postoperative rehabilitation and so bed side knee bending could be started as early as 2nd post operative day. Patients were normally discharged after 3rd to 5th post-operative day.

The average union time in our study was 4.66 months, lower than some of the union rates of series with other implants (AO Blade Plate 7.7%)⁴.

There were 5 non unions (6.02%) in our study. Non-union rate of 28% (Rahme et al⁵), 10% (Erhan et al⁶) for Angled plate have been reported. Similar studies with PFN have reported non-union rates of 0% (Shieng et al⁶)

Based on Harris Hip scoring system only 5 (6.02%) of the patients had poor results.

We operated most of the patients within 5 days. The patients operated early had a better outcome than those in whom surgery was delayed⁷. Various studies have shown the four principal hospital factors affecting outcome after proximal fractures⁸.

- Time to operation
- Wound infection
- Re-operation
- Pressure sores

CONCLUSION

After our study of results of Proximal Femoral Nailing in the treatment of Peritrochanteric Fractures of femur we can conclude that:

1. Peritrochanteric fractures mainly result from high velocity trauma in young population and from low velocity trauma in elderly, are difficult to treat without internal or external fixation and are associated with many complications.
2. Of all the available modalities of fixation of peritrochanteric fractures, Proximal Femur Locking Nail (PFN) has given good overall results.
3. PFN is a closed nailing procedure which achieves a biological fracture fixation with minimal blood loss, preserving the fracture hematoma aiding in healing of the unstable peritrochanteric femur fractures.
4. Proximal and distal bolts passed through femoral nail gives good stability in axial and rotational axis, preventing shortening and malunion postoperatively.

5. As compared to other modalities, there is a low infection rate, as well as fewer postoperative complications.
6. The procedure takes less time and the patient can be mobilized fast postoperatively as well after fixation with PFN.
7. PFN should always be considered for management of peritrochanteric femur fractures in young as well as elderly patients who have multiple pre-existing illness.

CLINICAL CASES AND PHOTOS

50yrs/male, H/O RTA, presenting with Lt. Subtrochanteric fracture operated by PFN

Pre-operative and Immediate postoperative



6months and 1year follow up



Clinical Pictures

References

1. Schipper IB, Steyerberg EW, Castelein RM, et al.: Treatment Of Unstable Trochanteric Fractures: Randomized Comparison Of The Gamma Nail And. The Proximal Femoral Nail. J Bone Joint Surg [Br] 2004; 86-B:86-94.
2. Sadowski C, Lubbeke A, Saudan M, Riand N, Stern R, Hoffmeyer P: Treatment of reverse oblique and transverse intertrochanteric fractures with use of an intramedullary nail or a 95 degrees screw-plate: A Prospective Randomized study. J Bone Joint Surg Am 2002; 84:372-81.
3. David G. La Velle: Fractures of Hip; Campbell's Operative Orthopaedics Vol.III, 11th International Edition, 2008.
4. Erhan Yolmaz, Lokman Karakurt, Hikmet Güzel, Erhan Serin: Evaluation of Treatment Results with The 95-degree AO/ASIF angular plate in subtrochanteric femur fractures. Joint Dis Rel Surg; 2005;16(1):42-48
5. DM Rahme, IA Harris: Intramedullary nailing versus fixed angle blade plating for subtrochanteric femoral fractures: A Prospective Randomised Controlled trial. Journal of Orthopaedic Surgery 2007;15(3):278-81.
6. Lei-Sheng Jiang, Lei Shen, Li-Yang Dai: Intramedullary Fixation of Subtrochanteric Fractures with Long Proximal Femoral Nail or Long Gamma Nail: Technical Notes and Preliminary Results Ann Acad Med Singapore 2007;36:821-6.
7. R. Dorotka, H. Schoechnner: The Influence of Immediate Surgical Treatment of Proximal Femoral Fractures on Mortality and Quality of life. J. Bone Joint Surg B 2003:1107-13
8. H.J. Fox, J.Pooler: Factors affecting the outcome after Proximal Femoral Fractures: Injury,1994, Vol 25 297-300