



ORIGINAL RESEARCH PAPER

Orthopaedics

MANAGEMENT OF SUBTROCHANTERIC FRACTURE FEMUR WITH PROXIMAL FEMORAL NAIL (PFN)-A PROSPECTIVE STUDY

KEY WORDS: Seinsheimer classification; Proximal Femoral Nail

Dr. Arjun Singh Rathore

Junior Resident Department of Orthopaedics Mahatama Gandhi Medical College & Hospital, Jaipur

Dr. S. P. Gupta*

Professor & Head Department of Orthopaedics Mahatama Gandhi Medical College & Hospital, Jaipur *Corresponding Author

ABSTRACT

INTRODUCTION : Subtrochanteric fractures of the femur are common injuries in adults and old age population. The study was conducted to assess the utility and effectiveness of Proximal Femoral Nail (PFN) as treatment modality of choice for subtrochanteric femoral fractures.

MATERIALS AND METHODS : Prospective study of 30 patients with subtrochanteric fractures of femur who were treated with PFN at a tertiary care centre from April, 2016 to March, 2017.

RESULTS : The mean age of the patients is 50.17 years with maximum of 74 years and minimum of 21 years.

CONCLUSION : The successful outcome depends upon proper patient selection, good understanding of fracture biomechanics, good pre operative planning, accurate instrumentation, good image intensifier, perfectly performed osteosynthesis and most importantly a skilled and experienced orthopaedic surgeon.

INTRODUCTION

Subtrochanteric fractures of the femur are common injuries in adults and constitute a vast majority of admissions in orthopaedic wards.

Historically these fractures were treated with broadly two modalities of internal fixation i.e. sliding compression hip screw with side plate assembly and intra medullary fixation devices.

Proximal Femoral Nail was introduced in 1997 by AO-ASIF have shown better results in the management of these fractures because of its improved well proven design, optimal stability, additional anchoring, dynamic locking, option for secondary dynamic locking, ease of insertion and prevention of later fracture.

This prospective study is conducted to assess the utility and effectiveness of Proximal Femoral Nail, as the treatment modality of choice for Subtrochanteric femoral fractures.

AIMS & OBJECTIVES

- To study the various fracture patterns of subtrochanteric region of femur.
- To study the management of subtrochanteric fracture of femur with proximal femoral nail.
- To study operative difficulties encountered during the procedure.
- To determine correct indications for use of proximal femoral nail in subtrochanteric femoral fractures.
- To evaluate the results in terms of clinic radiological union and ultimate functional outcome.
- To assess post operative rehabilitation of the patient in terms of hip range of motion and walking ability.

MATERIALS AND METHODS

This prospective study consists of thirty patients of subtrochanteric femur fracture, who were admitted and treated in the orthopaedic Department of Mahatma Gandhi Medical College and Hospital, Sitapura Jaipur by Proximal Femoral Nail from April, 2016 to March, 2017.

This was done to study the epidemiology of subtrochanteric fractures and to testify the anatomical and functional outcomes of treatment with proximal femoral nail.

Inclusion Criteria

- All patients with subtrochanteric femur fracture.
- Age groups from 18 years and above.

Exclusion Criteria

- Pediatric injuries.
- Grossly compound fractures.

Pre Operatively

- Nail diameter was determined preoperatively by measuring diameter of the femur at the level of isthmus on an AP view x-ray and neck shaft angle was measured on unaffected side on an AP X-ray using goniometer.
- Length of nail, long or short depending upon the fracture personality.
- Patients were assessed clinically and radiologically after 6 weeks, 3 months and then between 6 months and 1 year depending upon the fracture union.
- These findings were documented according to the protocol that was developed.
- Healing was judged by clinical (pain and motion at fracture site) and radiological (bridging callus filling the fracture site or trabeculations across the fracture site) criteria and functional outcome was assessed according to KYLE's CRITERIA.

RESULTS

- All patients operated were followed up till eventual recovery and none was lost to follow up due to the pre operative counseling.
- All the cases included in our study were fresh fractures who underwent surgery as early as possible in our set up.
- The mean age of the patients is 50.17 years with maximum of 74 years and minimum of 21 years.
- There were 21 male patients and 9 female patients.
- 18 patients had simple fall, 9 had road traffic accident and 3 had fall from height as the mechanism of injury.
- 19 patients had fracture on right side and 11 on left side.
- According to Seinsheimer classification one was type I, four were type IIA, two were type IIB, six were IIC, eight were type IIIA, three were type IIIB and three each were type IV and V.
- All the patients were operated on an average interval of 10.54 days after admission.
- Twelve patients were implanted with short PFN and eighteen with long PFN.
- The average blood loss was **120 ml** and mean operative time was **76 minutes**.
- Intra-operatively reduction of fracture was achieved through closed means in 27 cases and open reduction was performed in only 3 patients.
- Intra operatively one patient had failure to put derotation screw, one had failure to put distal locking screw and two had varus angulation.
- In our study, we had no early postoperative complications.
- Percentage of late postoperative complications was 20% yet they affected only 10% (3) of patients.

- 2 patients had delayed union along with restriction of hip range of motion which achieved radiological union after dynamization and one patient had non-union with shortening of more than 2 cm.
- The patient with non-union had to be re-operated and revision bipolar hemiarthroplasty was done after implant removal.
- The average radiological fracture union was 12.34 weeks and the mean duration of hospital stay was 26 days.
- Functional outcome according to Kyle's Criteria which shows excellent results in 90% of patients (27), good result in 3.34% (1), fair outcome in 3.34% (1) and poor result in 3.34% (1) patient.
- The patients with excellent functional outcome achieved independent mobility status with no pain or limp.
- Patients with good and fair functional outcomes had mild pain and used support to walk where as the patient with poor outcome had non-union and shortening which was revised to cemented bipolar hemiarthroplasty after implant removal.

CONCLUSION

- From this, we conclude that Proximal Femoral Nail is an excellent implant for the treatment of subtrochanteric fractures of femur.
- Use of proximal femoral nail in these fractures provides various advantages as closed reduction, preservation of fracture hematoma, minimal tissue damage, reduced moment arm and biomechanically superior stabilization as compared to extra-medullary devices.
- The successful outcome depends upon proper patient selection, good understanding of fracture biomechanics, good pre operative planning, accurate instrumentation, good image intensifier, perfectly performed osteosynthesis and most importantly a skilled and experienced orthopaedic surgeon.

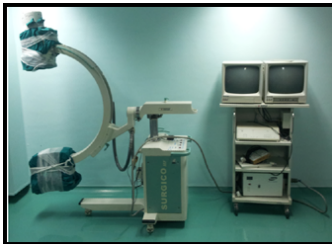


Photo : Image intensifier.

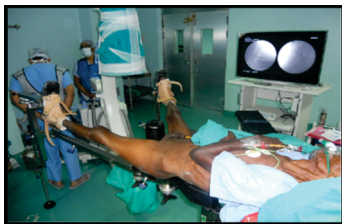


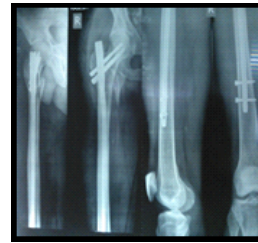
Photo : Patient positioning on fracture table.



Photo : Proximal Femoral Nailing System (implant set)



Pre Op X-Ray.



Post Op X-Ray.



Post Op X-Ray at 4 months.

REFERENCES:

1. LaVelle DG. Fractures and dislocations of Hip. In: Canale S, editor. Campbell's Oper. Orthop. 11th ed. Elsevier Mosby; 2008. p. 3262-90.
2. A, Bedi, Toan Le T. Subtrochanteric femur fractures. Orthop. Clin. North Am. 2004;35(4):473-83.
3. Boldin CS, Fankhauser F, Peicha F, Grechenig G, Rudolf. The proximal femoral nail (PFN)-a minimal invasive treatment of unstable proximal femoral fractures: a prospective study of 55 patients with a follow-up of 15 months. Acta Orthop. Scand. 2003;74(1):53-8.
4. M.J. Parkar, B.K. Dutta, C. Shivaji et al. Subtrochanteric fracture of the femur injury 28 (1997) pp 91-95.
5. RF Kyle, ME Cabanela, TA Russell et al. Fractures of the proximal part of the femur. Instrcoursect,44(1995) pp 227-253.
6. P Merreddy, S Kamath, M Ramakrishnan, et al. The AO/ASIF proximal femoral nail antirotation (PFNA) a new design for treatment of unstable proximal femoral fractures.