

Proximal Femoral Nail Still of Implant of Choice in Trochanteric Fracture

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ABSTRACT

Introduction: Proximal femoral nail (PFN) has become popular since last two decades in case of trochanteric fracture. Various studies has been done on femoral nail. FDA does not suggest the use of PFN in trochanteric fracture due to its high complication rates but if it is done with proper surgical technique improved results are seen. The aim of the study was to ascertain that proximal femoral nail is still one of the implant of choice in trochanteric fracture.

Material and methods: The study was done in Rohilkhand Medical college and Hospital during 2013 to 2015. 60 patients of trochanteric fracture who were treated with proximal femoral nail were include in this study. All tronchanteric fractures were classified according to A/O. The results were evaluated with functional outcome as Harris hip score.

Results: 60 patients of either sex with trochanteric fractures were studied with follow up of 6 months. The largest group of patients were of 51 to 60 years (14). Most road traffic accident patients were young and active males. The Reduction was achieved by closed method in 52 patients and 8 required open reduction. 2 patients had a fracture of lateral cortex. Total complications were 20% with no Z - effect. The Harris hip score was excellent in 32 patients, good in 15 patients, fair in 8 patients, poor in 5 patients.

Conclusion: PFN is technically required because it gives excellent results without valgus angulation and Z effect in trochanteric fracture and has good functional outcome.

Keyword: trochanteric fractur, proximal femoral nail, varus Collapse.

INTRODUCTION

Proximal femoral nail are common implant used in trochanteric fracture of femur. Trochanteric fracture is a very common fracture in an elderly population. Now Trochanteric fracture is common in young population due to increasing frequency of road traffic accidents.¹ In this era early mobilization and less surgical scar mark with less complication is the primary aim of surgical treatments with less economic loss. The proximal femoral nail was introduced by A.O/AISF in 1996. PFN is a load sharing implant, but after introduction of PFN various studies taken in support and against of PFN in trochanteric fractures.² However, till today people still prefer DHS as the gold standard in trochanteric fracture. Various studies on PFN have shown that the complication rates are higher like screw cut out proximal femoral fracture, higher re operation rates.² In our study we reported that adequate use of implant with good surgical understanding reduced the complications of the proximal femoral nail and it is still a good implant for trochanteric fracture fixation.

MATERIAL AND METHODS

The material for the present study was obtained from the

patients admitted in the Rohilkhand Medical College and Hospital Bareilly, Department of Orthopedics with diagnosis of trochanteric fracture between 1st Nov 2013 to July 2015. Ethical clearance taken by college ethical committee. Consent was taken and patients know about the study, 60 cases were taken which included 33 males and 27 females with 6 month follow up with PFN fixation. All trochantric fracture with skelatal mature patients were included in study. Fracture was classified according to the A.O system; the most common fracture types were A2, followed by A1 and A3. The reduction was achieved by closed manipulation, and traction on fracture table. The open reduction was done in which reduction not achieved in closed means fixation was done with short PFN - and long PFN. Lag screw 90-105 mm and hip pin shorter then lag screw are used, lag screw was inserted near the subchondral bone intraoperative and postoperative assessment was done. Broad spectrum antibiotics were given intravenously for first 3 days followed by oral antibiotics up to 12 days postoperative till suture removal.

Patients were allowed to stand on the bedside on the 2nd day postoperatively. Partial weight –bearing walking allowed in 5 days, and full weight bearing in 7 days postoperatively. On 3rd postoperative day X-ray was taken, another x-ray was taken in the 1st month then in every 2 months for radiological and clinical assessment of Harris hip score up to 6 months.

STATISTICAL ANALYSIS

SPSS version 21 was used for statistical analysis. Descriptive statistics were used to interpret results.

RESULTS

The study involved 60 confirmed cases of trochanteric fractures of either sex from Nov 2013 to June 2015. All the cases were treated with Intramedullary fixation-. “Proximal femoral nail” The analysis of the patient data, intra operative data and post operative outcome is as follows. The age distribution was from 21 to 85 years. The average age was 52.66 years the largest group of patients being from 51 to 60. 60 patients of either sex with pair trochanteric fractures were studied with follow- up to 6 months. There were 27 females and 33 males. 42 fractures were due to domestic fall and 18 due to road traffic accidents (table-1). Most road traffic accidents patients were young and

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How to cite this article: Ajay Kumar, T. Somashekareappa, Ajit Singh, R K Narula. Proximal femoral nail still of implant of choice in trochanteric fracture. International Journal of Contemporary Medical Research 2016;3(7):1967-1969.

active males. According to A.O classification, 20 patients 31A1 table, 30 patients 31A2 unstable, 10 had 31A3 unstable (table-2). The reduction was achieved as closed in 52 patients and 8 required open reduction. Average radiation exposure via C-arm was 43 at 63 rads. The average blood loss was 103 ml and six patients required blood transfusion. The average operating time was 70 minutes. 12 patients had intraoperative complications like failure in proximal screw, varus angulation, failure in distal screw, 2 patients had a fracture of lateral cortex. In delayed complications 6 patients who had hip joint stiffness were above 70 years of age, 2 patients had knee joint stiffness, 2 patients had a limb length discrepancy more than 2 cm, and 2 patients with varus angulations. Total complications were 20% (table-3). The average hospital stay was 16.80 days. The Harris hip score was excellent in 32 patients, good in 15 patients, fair in 8 patients, poor in 5 patient results according to Harris hip score (table-4)

DISCUSSION

The successful treatment of trochanteric fracture depends on many factors: the age of the, the general health, type of fracture, adequacy of treatment and stability of fracture.³

The PFN nail is shown to prevent the fracture of the trochanteric by having a small distal shaft diameter which reduces stress concentration at the tip.⁴ Due to its position close to the weight bearing axis stress generated on the intermedullary implants is negligible. Buttress effect of PFN prevents the medialisation of the shaft. The entry portal of the proximal femoral nail through the trochanteric limits the surgical insult to the tendinous abductor musculature only.⁵

In the series 295 patients with trochanteric fracture were treated with PFN by Domingo et al⁶ the average age at that study was 80 year .27% of the patients developed complication in the immediate postoperative period. In that study the overall results obtained were acceptable. J Pajarinen⁷ et al were not able to show clear superiority of PFN in view of increased operation time.

Sudan et al⁸ found no statistical difference between two groups PFN group and DHS. PFN has higher failure screw rates. In screw failure rates the screw placed is superior, we think that it is not due to the implant failure but due to technical failure. In our study rates of screw failure is less due to better technical understanding.

In a study of 35 patients by Metin Uzun et al⁹ in 2009 long term x-ray complication was seen following treatment of trochanteric fracture with PFN which affected functional outcome in all the patients. Harris hip score was 82.1. The results were excellent in 11 patients (31.4%), good in 15 patients (42.9%), Fair in seven patients (20%), and poor in 2 patients (5.7%). In our study there was no z effect or reverse z effect, the Harris hip was superior than that study.

Ballal et al¹⁰ (2008) study recorded 216 patients of PFN fixation. They reported 12 PFN failed case in various groups with broken PFNs. In our study implant was not failed and union was achieved in all 60 cases.

Sung sookim et al¹¹ (2011) compared the curative effect of Proximal femoral nail antitrotation (PFNA) with a Proximal femoral nail (PFN). They studied 58 cases treated with PFNA, and 60 cases, who were treated by PFN from July 2005 to may

	Number of patients	Percentage
Domestic fall	42	70
Road traffic accident	18	30

Table-1: Types of injuries

Fracture pattern	Number of patients	Percentage
31A1-stable	20	33
31A2-unstable	30	50
31A3-unstable	10	16

Table-2: Fracture pattern

Operative complications	Number of patients	Percentage
Failure in proximal screw	6	10
Varus angulation	2	3
Failure in distal screw	2	3
Fracture of lateral / cortex	2	3
Femoral fracture	0	0
Hip joint stiffens	6	10
Knee joint stiffens	2	3
Shorting	2	3
Varus angulation	2	3
Z effect	2	3

Table-3: Complications

Results	Number of patients	Percentage
Excellent	32	53
Good	15	25
Fair	8	13
Poor	5	9

Table-4 Harris hip score

2007. There was no difference in results of PFN and PFNA. Our study also support that PFN has best results and less economic issues than other implants.

Hesham et al¹² study involved 20 patients with trochanteric fracture fixation with proximal femoral nail. They studied both clinically and radiographically. The age group was between 20 to 70 years of age and used merle D Aubigne scoring system. They received excellent 25%, good (40%), fair (20%) and poor (15%). Our results based on Harris hip score which had good results.

In our study no case reported with deep vein thrombosis. Hotz et al¹³ reported 37 cases of deep vein thrombosis treated with proximal femoral nail.

Koyuncu et al¹⁴ in 2015 studied 152 patients of trochanteric fracture with osteosynthesis by proximal femoral nail and reported late complication in 27 patients. In our study no case reported to cutout and z effect after follow up upto 6 month which is in contrast to Koyuncu et al.¹⁴

Windolf et al¹⁵ reported major patients with poor outcomes. Osteosynthesis with PFN is a better method for simple trochanteric fractures with excellent bone quality; it is not advisable in fixation of complex fractures in patients with reduced bone density. In our study, reduction was a significant factor and achieved by both open and closed method.

CONCLUSION

PFN is technically sensitive, with proper anatomical and surgical

technique it gives excellent results without valgus angulation and Z effect in trochanteric fracture and is associated with good functional outcome.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 17-05-2016; **Published online:** 22-06-2016

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