



COMPARATIVE STUDY OF TREATMENT OF INTERTROCHANTERIC FEMUR FRACTURES BY PROXIMAL FEMORAL NAIL (PFN) AND PROXIMAL FEMORAL NAIL-ANTIROTATION (PFN-A)

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ABSTRACT **Introduction:** Proximal femoral fractures are a big challenge in traumatology both for orthopaedic surgeons and anaesthetists. Proximal femoral fractures include the intracapsular and extracapsular fractures. Pertrochanteric, intertrochanteric and subtrochanteric fractures are extracapsular fractures. The present study was aimed to compare the results of surgical management of Inter-trochanteric femoral fractures treated by Proximal Femoral Nail (PFN) and Proximal Femoral Nail Antirotation (PFN-A) as regards to Fracture union in terms of radiological outcome and functional restoration and to study the complications and their management. The present study was conducted on 30 adult patients (both male and female above the age of 50 years) with Intertrochanteric femoral fractures attending the Out Patient Department/Emergency of the Department of Orthopaedics, MMIMSR. 15 Patients each were randomly selected for PFN and PFN-A fixation. The functional outcomes achieved after treatment of unstable intertrochanteric fractures with both PFN and PFNA are satisfactory and comparable. The PFNA is an easier implant to insert owing to a single device for proximal fixation, which translates into lesser surgical time as compared to the PFN. The number of implant related complications encountered with the helical blade are lesser than that with the PFN. This can be attributed to the biomechanically superior hold of the helical blade by virtue of compaction of cancellous bone around it. Irrespective of the implant used, the quality of reduction achieved intra-operatively is the major determinant of success of fracture fixation. Functional outcomes after intertrochanteric fractures especially in the elderly are only in part dependent on the implant and fracture union. Age, general debility and pre injury functional status are also major determinants of post operative outcome.

KEYWORDS : Intertrochanteric fractures, proximal femoral nail (PFN), Proximal femoral nail antirotation (PFNA).

INTRODUCTION

Proximal femoral fractures are a big challenge in traumatology both for orthopaedic surgeons and anaesthetists. These fractures are relatively common in the elderly in 5th decade of life due to decreasing bone stock, leading to fracture by trivial trauma thus necessitating the hospital admission. ⁽¹⁾ The younger age group is getting involved because of high-energy trauma and rapid industrialization with resultant complex pattern of injury in the working class of people. ⁽²⁾ The proximal femoral fractures occur 2 to 3 times more in females than in males. The risk of suffering from a proximal femur fracture doubles every ten years after the age of fifty. ⁽¹⁾ Substantial morbidity and mortality is associated with proximal femur fractures. Proximal femoral fractures include the intracapsular and extracapsular fractures. Intracapsular fractures are femoral head and neck fractures proximal to the attachment of hip capsule. Pertrochanteric, intertrochanteric and subtrochanteric fractures are extracapsular fractures.

The present study was aimed to compare the results of surgical management of Inter-trochanteric femoral fractures treated by Proximal Femoral Nail (PFN) and Proximal Femoral Nail Antirotation (PFN-A) as regards to:

- Fracture union in terms of radiological outcome and functional restoration
- Study the complications and their management

Proximal femoral nail provides ideal internal fixation for unstable multifragment intertrochanteric, and sub trochanteric fractures. The PFN had several advantages, which included little soft tissue trauma, rotational stability of the head/neck fragment, shorter surgical times and less blood loss. It was said to have an increased strength of fixation in osteoporotic bone, owing to the increased implant-bone contact area. ⁽³⁾

The proximal femoral nail antirotation (PFNA) was designed with its novation being the helical neck blade. Changing the column screw into a helical blade increases the contact surface area between the purchase holding device and the femoral head cancellous bone. ^(4,5) During insertion of the blade, it compresses rather than removes the limited amount of osteoporotic bone in the proximal femur. This mechanism

prevents bone loss and offers improved purchase in the femoral head due to compaction of cancellous bone around the blade during insertion. ⁽⁶⁾

MATERIAL AND METHODS

The present study was conducted on 30 adult patients (both male and female above the age of 50 years) with Intertrochanteric femoral fractures attending the Out Patient Department/Emergency of the Department of Orthopaedics, MMIMSR. 15 Patients each were randomly selected for PFN and PFN-A fixation. All patients on admission were subjected to initial management and resuscitation as regards to shock, pain, splintage etc. Injuries of Head/Abdomen/chest were treated at priority and the affected limb was immobilized with skin or skeletal traction over Bohler-Braun splint. After initial resuscitation, patients were subjected to detailed history, relevant investigations and thorough clinical examinations and included in study as per **INCLUSION and EXCLUSION CRITERIA.**

All patients were advised regular follow up, initially at 3 weekly intervals, till 12th postoperative week and then at 6 weekly interval till the completion of 24 weeks postoperatively. Further follow up was advised at 6 weekly intervals for the patients who showed complications associated with PFN and/or its technique. Weight bearing was gradually increased as per the radiological evaluation of the fractured site. The hip scoring was done as per the following:

GRADING OF HARRIS HIP SCORE

POOR	LESS THAN 70
FAIR	SCORE 70 TO 79
GOOD	SCORE 80 TO 89
EXCELLENT	SCORE 90 TO 100

RESULT

Table 1: Age Distribution

Age Group	PFN	PFN A
<=60	8 (53 %)	6 (40 %)
61 - 70	4 (27 %)	3 (20 %)

71 - 80	1 (7 %)	4 (27 %)
>80	2 (13 %)	2 (13 %)
Total	15 (100 %)	15 (100 %)

In our study for PFN maximum number of patients (53%) were 51-60 year age group followed by 61-70 year age group with 27% of the total patients. The mean age of the patients was 64.53 year whereas in patients receiving PFN A maximum number of patients (40%) were in 51-60 year age group followed by 71-80 year age group with 27% of the total patients. The mean age of the patients was 65.67 years.

Table 3: HARRIS Grade

HARRIS Grade	PFN	PFN A
Excellent	11 (73 %)	13 (87 %)
Fair	1 (7 %)	0 (0 %)
Good	3 (20 %)	2 (13 %)
Total	15 (100 %)	15 (100 %)

In the present study 11 patients (73%) had an excellent harris grade, 3 patients (20%) had a good harris grade and 1 patient (7%) had a fair harris grade in the PFN group. On the other hand among the PFN A group (87%) had an excellent harris grade and 2 patients (13%) had a good harris grade.

X-RAY IN A CASE TREATED WITH PFN



PRE-OPERATIVE



POST OPERATIVE

X-RAY IN A CASE TREATED WITH PFNA



PRE-OPERATIVE



POST-OPERATIVE

DISCUSSION

The trochanter area, which consists of greater trochanter and lesser trochanter representing the transitional zone between femur neck and shaft. The intertrochanteric region has abundant blood supply and osteogenic properties hence fracture union occurs more often than not. Earlier conservative treatment was given for these fractures which resulted in delayed mobilization and malunion as the patients were bed ridden for long periods resulting in various morbidities like bed sores, deep vein thrombosis etc.

In the current study we aim to reduce the morbidities associated with intertrochanteric fractures by managing them with proximal femur nail (PFN) and PFNA, which is a minimal invasive technique. In this study of 15 patients were of PFN and 15 patients were of PFNA.

CONCLUSION

The functional outcomes achieved after treatment of unstable intertrochanteric fractures with both PFN and PFNA are satisfactory and comparable. The PFNA is an easier implant to insert owing to a single device for proximal fixation, which translates into lesser surgical time as compared to the PFN. The number of implant related complications encountered with the helical blade are lesser than that with the PFN. This can be attributed to the biomechanically superior hold of the helical blade by virtue of compaction of cancellous bone around it Irrespective of the implant used, the quality of reduction achieved intra-operatively is the major determinant of success of fracture fixation. Functional outcomes after intertrochanteric fractures especially in the elderly are only in part dependent on the implant and fracture union. Age, general debility and pre injury functional status are also major determinants of postoperative outcome.

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