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ORIGINAL ARTICLE

A CLINICAL STUDY OF PROXIMAL FEMUR NAIL (PFN) IN THE MANAGEMENT OF COMMUNITED INTERTROCHANTERIC FRACTURES OF THE FEMUR

S. Hari Babu[1], K. Satish[2], G. Suresh Babu[3], E. Naresh[4]

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ABSTRACT: Fractures of proximal femur and hip are relatively common injuries in elderly individuals. Incidence has increased primarily due to increasing life span and more sedentary lifestyle brought by urbanization. In younger population, Inter trochanteric fracture is usually the result of high- energy injury, such as motor vehicle accident or fall from height. All treatment modalities are aimed at preventing malunion and deformity. This study consist of 56 cases of comminuted intertrochanteric fractures & sub trochanteric fractures, selected randomly and treated by PFN (intramedullary device) and evaluation of their clinical outcome. **MATERIALS AND METHODS:** The present study consists of 56 elderly patients with intertrochanteric & sub trochanteric fractures of femur who were treated with PFN in Department of Orthopaedics S.V.R.R.G.G.H, Tirupati during the period of Oct 2010 to Sep 2015. This study was carried out to study the results of intertrochanteric & sub trochanteric fractures treated with PFN. All the 56 patients were followed up at regular interval. Inclusion Criteria included Adult Patients with comminuted trochanteric & sub trochanteric fractures. Exclusion Criteria include, Open fractures, Pathological fractures, Pediatric fractures, Patients associated with polytrauma. **CONCLUSION** From the study, we consider PFN as better option in the treatment of comminuted intertrochanteric & sub trochanteric fractures but is technically difficult procedure and requires more expertise. As learning curve of PFN procedure is steep, with experience gained from each case operative time, radiation exposure and intraoperative complications can be reduced in each case of PFN.

KEYWORDS: Proximal Femoral Nail (PFN), Intertrochanteric, Sub trochanteric fracture.

INTRODUCTION: Fractures of proximal femur and hip are relatively common injuries in elderly individuals, constituting 11.6% of total fractures. Of these intertrochanteric fractures constitute 53.4% with a female predominance (3:1).[1] Intertrochanteric fractures are commonly seen in patients over 60 years of age, mostly due to trivial trauma. Incidence has increased primarily due to increasing life span and more sedentary lifestyle brought by urbanization.

In elderly 90% of intertrochanteric fractures result from simple falls, of these pathological fractures constitute 1.3% of total fractures.[2] In younger population, Inter trochanteric fracture are usually the result of high- energy injury, such as motor vehicle accident or fall from height.

This group of fractures form sizeable portion of admissions to trauma ward, their management has created considerable interest in this century. Fortunately for these fractures union is not a problem due to abundant blood supply, cancellous nature of bone and a wide cross

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sectional area at fracture site.[3] All treatment modalities are aimed at preventing malunion and deformity.

Internal fixation of the intertrochanteric fracture with early mobilization is considered as standard treatment. The only exception being a medically unstable patient, who has anaesthetic and surgical risk.

Though conservative treatment yields good results but necessitates prolonged immobilization of not less than two months duration with obvious economic implications, not to mention the pin tract problems and the ills of enforced bed rest in the elderly, viz: bed sores, deep vein thrombosis, fracture disease and pulmonary embolism. Another feature of conservative regime is the possibility of varus drift and shortening in spite of adequate period of immobilization. Therefore Surgery is the mainstay of treatment. The goal of treatment is fracture reduction so that near anatomic alignment and normal femoral anteversion are obtained.[4]

Various internal fixation implants are available which includes which can be broadly classified into intramedullary devices and extramedullary devices.

This study consist of 56 cases of comminuted intertrochanteric fractures & sub trochanteric fractures, selected randomly and treated by PFN (intramedullary device) and evaluation of their clinical outcome.

MATERIALS AND METHODS: The present study consists of 56 elderly patients with intertrochanteric & sub trochanteric fractures of femur who were treated with PFN in Department of Orthopaedics S.V.R.R.G.G.H, Tirupati during the period of Oct 2010 to Sep 2015.

This study was carried out to study the results of intertrochanteric & sub trochanteric fractures treated with PFN. All the 56 patients were followed up at regular interval. Inclusion Criteria included Adult Patients with comminuted trochanteric & sub trochanteric fractures. Exclusion Criteria include, Open fractures, Pathological fractures, Pediatric fractures, Patients associated with polytrauma.

As soon as the patient with suspected Intertrochanteric & sub trochanteric fracture was seen, necessary clinical and radiological evaluation was done and admitted to ward after necessary resuscitation and splintage with either skin or skeletal traction. All the routine investigations were done as follows haemogram, blood urea, serum creatinine, urine routine, microscopy, blood sugar level, serum electrolytes, blood group, HIV, HBsAg, HCV, Chest X-ray and ECG. All the patients were evaluated for associated medical problems and were referred to respective department and treated accordingly. Associated injuries were evaluated and treated simultaneously. The patients were operated on elective basis after overcoming the avoidable anaesthetic risks.

End results were assessed based on Harris Hip Scoring System (Modified).[5]

RESULTS: The following observations were made from the data collected out of 56 cases of intertrochanteric & sub trochanteric fractures were treated by Proximal Femoral Nail in the Department of Orthopaedics in S. V. R. R. Government General Hospital, Tirupati from October 2010-october 2015.

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1. **AGE AND SEX DISTRIBUTION:** In our study maximum age was 64 years and minimum age was 36 years. Most of the patients were between 50- 80 years. Mean age was 59.25 years. There were 30 male (53.57%) and 26 female patients (46.42%).
2. **NATURE OF INJURY:** Most of cases were result of slip and fall, Slip and Fall: 40(71.43%), Fall from height: 12(21.43%), RTA: 4(7.14%).
3. **SIDE AFFECTED:** Right hip was involved in 30 cases (53.57%), left involved in 26 cases (46.42%).
4. **TIME OF SURGERY:** All the patients were operated at an average interval of 8.6 days from the day of trauma.
5. **INTRA OPERATIVE DETAILS:** Blood loss was measured by mop count (each fully soaked mop contain 50ml of blood) and collection in suction.

INTRAOPERATIVE DETAILS	PFN
Mean Radiographic exposure (no of times)	40
Mean Duration of operation (in minutes)	90
Mean Blood loss (in milli litres)	100
Other intra operative details are illustrated in table	

6. **INTRA OPERATIVE COMPLICATIONS:**

Complications	No. of Cases	Percentage
Failure to achieve closed reduction	3	5.36%
Fracture of lateral cortex	1	1.79%
Breakage of guide wire	1	1.79%
Inability to accommodate both proximal screws in the femoral neck	3	5.36%
Intra operative complications included with PFN		

7. **INFECTION: Post-operative complications included three case of superficial infection. No deep infection was noted.**
8. **DELAYED COMPLICATIONS:**

Complications	Number of Cases	Percentage
Hip stiffness	1	1.79%
Knee stiffness	0	0%
Shortening of >1cm	4	7.14%
Varus Malunion	3	5.36%
Persistent hip pain	1	1.79%
Screw backouts	2	3.57
Delayed Complication among PFN Group		

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There were no cases of nail breakage. There was no case of femoral shaft fracture or non-union or implant failure.

9. **DURATION OF HOSPITAL STAY:** In our study the average duration of hospital stay was 23 days for PFN patients. The mean time of full weight bearing was 10.8 weeks. All patients enjoyed good, hip and knee range of motion except for 1 patient of PFN who had extensive lateral cortex communition during surgery and had to be immobilized for prolonged period resulting in hip stiffness.

10. **RADIOLOGICAL UNION:** Time to healing, defined as the time of the formation or circumferential bridging callus across the fractures. The average time of healing was In PFN -12.25 Weeks

11. **FUNCTIONAL OUTCOME:**

Functional Results	Number of Cases	Percentage
Excellent	30	53.57%
Good	18	32.14%
Fair	7	12.5%
Poor	1	1.79%

Interpretation of functional results of PFN based on modified Harris hip score

CONCLUSION: From the study, we consider PFN as better option in the treatment of comminuted intertrochanteric & sub trochanteric fractures but is technically difficult procedure and requires more expertise. As learning curve of PFN procedure is steep, with experience gained from each case operative time, radiation exposure and intraoperative complications can be reduced in each case of PFN.

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AUTHORS:

1. S. Hari Babu
2. K. Satish
3. G. Suresh Babu
4. E. Naresh

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Orthopedics, S V. Medical College, Tirupati.
2. Associate Professor, Department of Orthopedics, S V. Medical College, Tirupati.
3. Post Graduate, Department of Orthopedics, S V. Medical College, Tirupati.
4. Senior Resident, Department of Orthopedics, S V. Medical College, Tirupati.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. S. Hari Babu,
Associate Professor,
Department of Orthopedics,
S V. Medical College, Tirupati.
E-mail: gangisb@gmail.com

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