Original Research Paper

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EVALUATION OF FUNCTIONAL OUTCOMES AND ANALYSIS OF PROXIMAL FEMORAL NAIL ANTIROTATION II IN THE TREATMENT OF TROCHANTERIC FRACTURES IN ELDERLY PATIENTS

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ABSTRACT **Introduction:** Intertrochanteric fractures are common injuries among the elderly population and those with osteoporosis The main characteristic of the implant is the use of a single blade with a large surface area and insertion of the blade compacts the cancellous bone . In this study, we studied outcomes of Proximal Femoral Nail Antirotation II (PFN-A2). **Material & Methods:** The present study was conducted in Department of Orthopaedics, MMIMSR, Mullana 20 patients > 60 age with intertrochanteric fracture are treated with PFN A2 were included in this study. All patients are followed up for minimum period of 6 months. Functional outcome were evaluated using Modified Harris Hip Score. **Conclusion:** PFN A-II is a significant advancement in the treatment of Intertrochanteric fractures which has the unique advantage of closed reduction, preservation of fracture hematoma, minimal soft tissue damage during surgery, early rehabilitation and early return to work.

KEYWORDS : Proximal Femoral Nail Antirotation II ,PFN A2; intertrochanteric fractures, Modified Harris Hip Score

INTRODUCTION:

Intertrochanteric fractures are the fracture involving the region extending from the extracapsular neck region to the region along the lesser trochanter proximal to the medullary canal which is commonly seen in elderly age group because of osteoporosis.[1]Complications with intertrochanteric fractures arise primarily from method of fixation rather than union or delayed union. because the intertrochanteric area is made up of cancellous bones[2] The goal of surgery is to provide a painless, mobile, and stable hip with normal abductor lever arm function. The ideal internal fixation device should be such that the patient can be mobilized at the earliest without jeopardizing the reduction, stability and union of the fracture.[3] Proximal femoral nail (PFN) is better fixation to DHS alone, because of short lever arm that resists the bending force. PFN is superior to extramedullary implants, complications such as screw cut out, back out continued to exist. This was overcome with the advent of Proximal Femoral Nail Antirotation II (PFN-A2) [4,5] Proximal Femoral Nail Antirotation II (PFN-A2) utilizes a single helical blade instead of the routinely used two screws. The helical blade is believed to provide stability, compression as well as rotational control of the fracture[6]

MATERIAL AND METHODS

Study Design:

Following approval from the institutional review board, the prospective, observational study was conducted in the Department of Orthopaedics, MMIMSR, Mullana.

Study Period:

september 2022 – February 2024 All patients were followed up for period of atleast 6 months

Sample Size:

Study included 20 patients operated with PFN A II for intertrochanteric fracture in MMIMSR Mullana as per inclusion and exclusion criteria given below.

Study Type:

A observational study of the functional outcomes of intertrochanteric fracture managed with PFN A II.

RESULTS:

Functional outcome based on pain, function using MODIFIED HARRIS HIP SCORE .

Study Population:

Inclusion Criteria:

Patients > 60 years of age presenting to our causality with intertrochanteric femoral fractures with all Boyd and Griffin types (1-4)

- Both displaced and Undisplaced fractures
- Fractures less than 1 week duration
- Without any other associated fractures

Exclusion Criteria:

- Fractures with non union changes
- Old malunited intertrochanteric fracture
- Patients with arthritic changes in hip joint
- Patient below 60 years of age
- Pathological fractures

Upon admission, patients were subjected to detailed history, relevant investigations and thorough clinical examinations

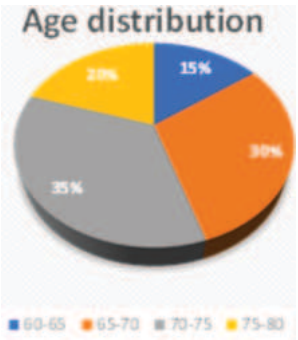
Post-op Protocol:

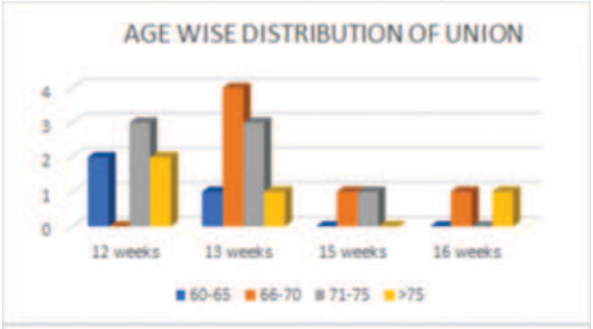
- Routine Post Operative Protocol and chest physiotherapy.
- Hip and knee Mobilisation from 1st post-op day .
- Weight-bearing increased gradedly as per tolerance.
- Peri-operative DVT prophylaxis with enoxaparin and ecosprin.

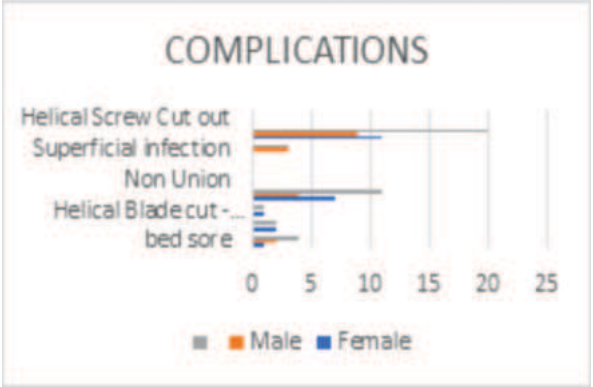
- Suture removal on 14th post-operative day

RESULTS:

All cases were followed up for a minimum of 12 months and were assessed for clinical, radiological, and functional outcomes. The results were analyzed. The observations of our study are as follows: The age groups varied from 60 years to 80 years with a mean age of 72 years. There was a female preponderance with 11 females and 9 males. Mode of injury was RTA (Road traffic accident) in 10 patients and Self-fall in 10 patients.12 patients suffered a fracture on the right side and 8 patients suffered a fracture on the left side. Boyd and Griffin type II (unstable) fractures are the most common type in our study followed by type IV and type III. The time duration of surgery of the patients varied from 40 mins to 100 mins with a mean of 62 mins. All patients were operated on within 7 days, the average being 4.6 days. Mean blood loss was 130 ml. The mean length of the incision was 5cm. The mean helical blade size was 85 mm. The average hospital stay was 7 days. The distribution of outcome grades among the various types of intertrochanteric fractures, according to Boyd and griffin ; type 1 fractures had excellent outcome, all type 2 had good outcome, type 3 and 4 had excellent, good and fair outcome. The distribution of outcome among age showed good outcome in age group of 60-65, good to excellent outcome in age group 66-70 and 71-75 , poor outcome was seen in age group of 76-80. Partial weight-bearing in most cases was allowed immediately on the 3rd postoperative day based on construct stability and bone quality. All fractures united on an average of 13 weeks. All patients were allowed to full weight bearing on an average by 12 weeks based on the clinical and radiological union.

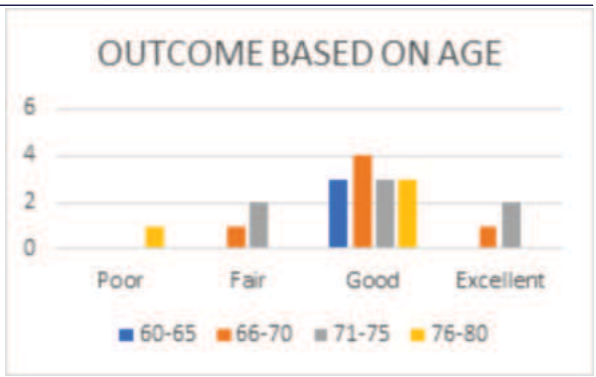


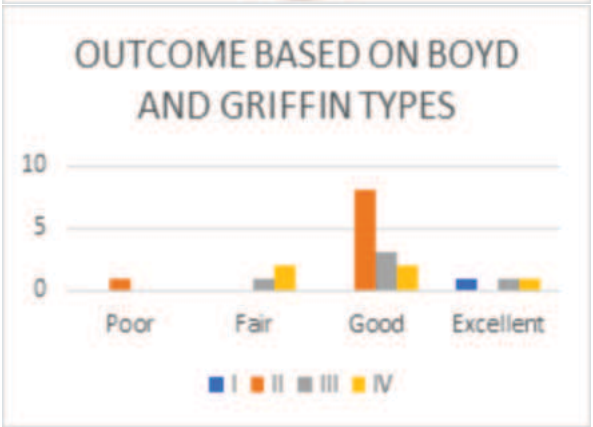




COMPLICATIONS:

Bed sore occurred in 3 patients , superficial infection occurred in 3 patients which resolved with antibiotics, 2 patients had deep infection which resolved with debridement and antibiotics, Helical screw cut-through occurred in 1 There were no cases of helical screw cut-out, revision surgery, non-union or deep vein thrombosis in our study.





DISCUSSION:

An efficient intramedullary load-sharing device is the PFN A-II. With adjustments for the Asian population, it combines the fundamental ideas and therapeutic benefits of the Zicker Nail and the Dynamic hip screw locked intramedullary nail. The larger proximal diameter (17 mm) of the PFN A-II compared with PFN (15 mm) gives additional stiffness to the nail. Minimal blood loss, shorter operative time, early weight bearing, less chances of implant failure, minimal fluoroscopy time, easier helical blade insertion (compared with cumbersome lag screw and derotation screw), lesser chances of post op hip pain, Absence of the "Z" effect ,better performance than any other implant in elderly osteoporotic patients are all advantage of PFN A-II. The average HARRIS HIP SCORE[7] in our patients was 79.8 (at the end of three months) and 82.3 (at the end of six months). Most of them were graded as “good” as per HARRIS HIP SCORING. Fair scores were seen with higher age group and higher Boyd and Griffin types. There were no cases of non-union reported in our study comparable to Levent karapinar et al. [8] wherein there was no reported cases of non-union. Studies which reported non-union were highlighting that higher types (type 3 and 4) showed tendency towards non-union. Decreases in implant curvature, diameter, over reaming of femoral canal by 1.5 to 2mm, insertion of the implant by hand and meticulous placement of the distal locking. Screws without creating additional stress risers decreases the complication rate of femoral shaft fracture (I.B. Schipper et al 2004)[9]. Patients with narrow femoral .canal and abnormal curvature of the proximal femur are relative contra-indications to intramedullary implants (Halder et al 1992)[10].

CONCLUSION:

Intramedullary nailing with the PFN A-II has distinct advantages over Conventional PFN or DHS like shorter operating time and lesser blood loss for elderly, osteoporotic unstable trochanteric fractures. PFN A-II is a significant advancement in the treatment of trochanteric fractures which has the unique advantage of closed reduction, preservation of fracture hematoma, minimal soft tissue damage during surgery, early rehabilitation and early return to work.

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