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Original Research

Evaluation of outcome of patients with intertrochanteric fractures treated with proximal femoral nail: An observational study

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ABSTRACT

Introduction: Hip fracture contributes to both morbidity and mortality in the elderly. The demographics of world populations are set to change, with more elderly living in developing countries.The dynamic hip screw, commonly used in extramedullary fixation, has become a standard implant in treatment of these fractures. Proximal femoral nail (PFN) and Gamma nail are 2 commonly used devices in the intramedullary fixation. Previous studies showed that the Gamma nail did not perform as well as DHS because it led to a relatively higher incidence of post-operative femoral shaft fracture.Hence; the present study was undertaken for assessing the outcome of patients with intertrochanteric fractures treated with PFN. **Materials & methods:** A total of 25 intertrochanteric fractures were included in the present study. All the patients were treated with PFN. A detailed questionnaire was duly completed for each case. Till the day of surgery, patient was kept on skeletal/skin traction. Pre-operative antibiotics were given to the patients. Pre-operative planning was done to decide the type and length of implant to be used. The choice of anaesthesia was general or regional. Clinico-radiological assessment of the patient was done. All the results were analysed by SPSS software. **Results:** In 92 percent of the patients, complete union was observed on radiological assessment after 18 weeks, whereas in the remaining 8 percent of the patients, no union was observed. Postoperative complications were present only in one patient, in the form of Z- effect at one month (Non- union). **Conclusion:** PFN appears to be an effective line of treatment for treating patients with intertrochanteric fractures.

Key words: Proximal femoral nail, Treatment

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INTRODUCTION

Hip fracture contributes to both morbidity and mortality in the elderly. The demographics of world populations are set to change, with more elderly living in developing countries.[1, 2]

Inter trochanteric fractures of femur occur in the area between the greater and lesser trochanter and may involve these two structures. Inter trochanteric fractures make up 45% of all hip fractures. This region consists of weight bearing trabeculaes and has a good amount of cancellous bone and vascularity thus minimizing the risk of avascular necrosis and non-union. Generally, intramedullary fixation and extramedullary fixation are the 2 primary options for treatment of such fractures. The dynamic hip screw, commonly used in extramedullary fixation, has become a standard implant in treatment of these fractures. Proximal femoral nail (PFN) and Gamma nail are 2 commonly used devices in the intramedullary fixation. Previous studies showed that the Gamma nail did not perform as well as DHS because it led to a relatively higher incidence of post-operative femoral shaft fracture.[3- 5]

PFN, introduced by the AO/ASIF group in 1997, has become prevalent in treatment of intertrochanteric fractures in recent years because it was improved by addition of an antirotation hip screw proximal to the main lag screw. However, both benefits and technical failures of PFN have been reported.[6]

Hence; the present study was undertaken for assessing the outcome of patients with intertrochanteric fractures treated with PFN.

MATERIALS & METHODS

The present study was scheduled in the department of orthopaedics of the medical institute and it included assessment of outcome of patients with intertrochanteric fractures treated with PFN. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 30 intertrochanteric fractures were included in the present study. All the patients were treated with PFN. A detailed questionnaire was duly completed for each case. The questionnaire included information on the age, occupation, smoking status, etc.

Inclusion criteria for the present study included:

- Closed inter-trochanteric fracture.
- Age > 18 years (skeletal maturity)
- Time < 2 weeks.
- Patient Willing

Exclusion criteria for the present study included:

- Age < 18 years. (skeletal immaturity)
- Time > 2 weeks.
- Associated Fracture neck femur.
- Compound fracture.
- Patient Refusal

Till the day of surgery, patient was kept on skeletal/skin traction. Pre-operative antibiotics were given to the patients. Pre-operative planning was done to decide the type and length of implant to be used. The choice of anaesthesia was general or regional.Discharge of patient from hospital done after satisfactory stitch removal, wound condition & physiotherapy achieved. Clinico-radiological assessment of the patient was done.All the results were analysed by SPSS software. Chi- square test and student t test were used for assessment of level of significance. P- Value of less than 0.05 was taken as significant.

RESULTS

In the present study, a total of 25 patients were enrolled. Mean age of the patients of the present study was 59.8 years. Majority of the patients belonged to the age group of 51 to 70 years.In 72 percent of the patients, minimal union was observed on radiological assessment after 10 weeks, whereas in the remaining 28 percent of the patients, no union was observed. In 92 percent of the patients, complete union was observed on radiological assessment after 18 weeks, whereas in the remaining 8 percent of the patients, no union was observed.Postoperative complications were present only in one patient, in the form of Z- effect at one month (Non-union).

Graph 1: Distribution of patients according to age

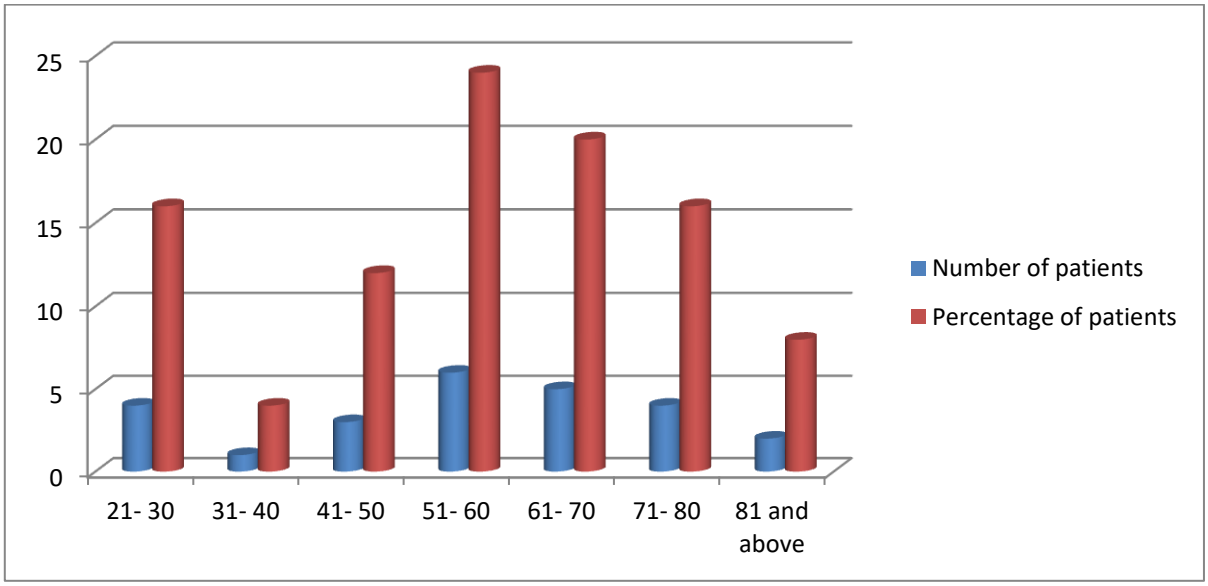

Table 1: Distribution of patients of PFN group according to radiological union after 10 weeks

Radiological callus	PFN	
	No. of patients	Percentage
Minimal union observed	18	72
No union observed	7	28
Total	25	100

Graph 2: Gender-wise distribution of patients

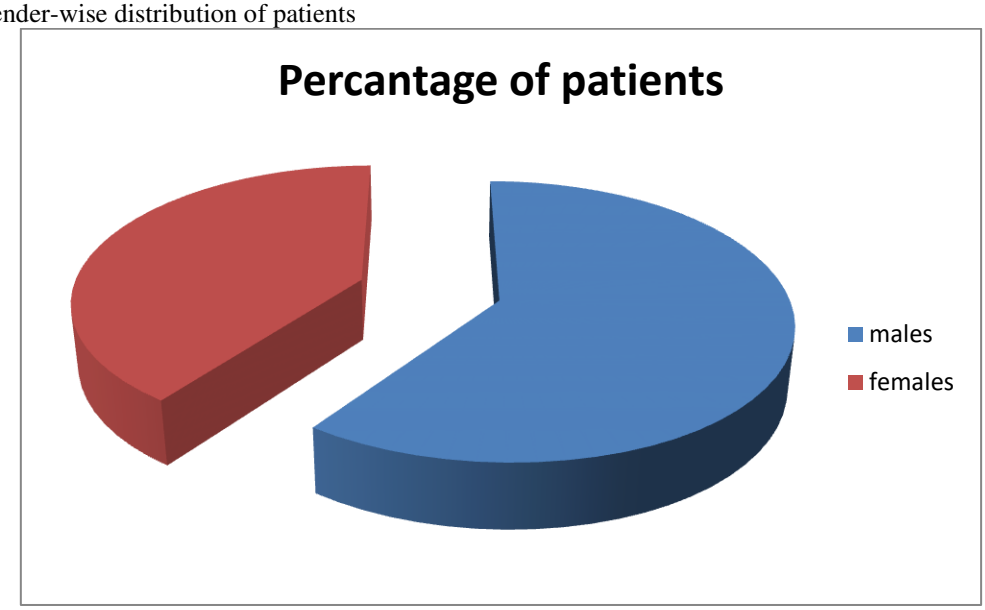

Table 2: Distribution of patients of PFN group according to radiological union after 18 weeks

Radiological callus	PFN	
	No. of patients	Percentage
Minimal union observed	0	0
No union observed	2	8
Union observed	23	92
Total	25	100

Table 3: Complications among patients of PFN group

Type of Complication	PFN	
	No. of patients	Percentage
Z- effect at one month (Non- union)	2	8
None	23	92
Total	25	100

DISCUSSION

Biomechanically, compared to a laterally fixed side plate, an intramedullary device decreases the bending force of the hip joint on implant by 25-30%. This has advantages especially in elderly patients, in whom the primary treatment goal is immediate full-weight bearing mobilization. So, now the intramedullary screw devices are gaining popularity for stabilizing intertrochanteric fractures.With the advent of proximal femoral nail the complications associated with gamma nail have been reduced and results of proximal femoral nail in treatment of intertrochanteric fractures are comparable or even better than dynamic hip screw especially in unstable intertrochanteric fractures.[6- 8]

In the present study, a total of 25 patients were enrolled. Mean age of the patients of the present study was 59.8 years. Majority of the patients belonged to the age group of 51 to 70 years. In 72 percent of the patients, minimal union was observed on radiological assessment after 10 weeks, whereas in the remaining 28 percent of the patients, no union was observed. Yadav S et al studied 92 cases, out of which 38 cases were treated by PFN and 54 cases were treated by DHS. Patients were followed up at 6, 12, 18 and 24 weeks. The results were compared for functional outcome using Palmer and Parker score and also for various complications. Comparison of mobility score at six month follow up period revealed the PFN group to be significantly more mobile (5.8 Vs. 4.19 respectively, p <0.001) than the DHS group. In our study 6 patients managed with DHS (6.52%) developed superficial wound infection which responded to intravenous antibiotics. No patient with PFN had wound infection. Only 2 patients in the PFN group and 12 patients in the DHS group had persistent pain at the incision site. Dynamic hip screw fixation of these fracture requires less preoperative time, is associated with less exposure to radiation but the blood loss is much higher. On the contrary PFN allows faster mobilization and greater mobility scores at six months.[9]

In the present study, in 92 percent of the patients, complete union was observed on radiological assessment after 18 weeks, whereas in the remaining 8 percent of the patients, no union was observed. Postoperative complications were present only in one patient, in the

form of Z- effect at one month (Non- union).Mittal M et al including 40 patients was carried out prospective randomized control study on 40 patients. The average blood loss, operating time and complications were significantly higher in the DHS group. PFN provides better fixation for unstable intertrochanteric fractures, if proper preoperative planning, good reduction and surgical technique are followed.[10] Singla G compared the clinical and radio-graphical results of the DHS and PFN for the treatment of Intertrochanteric hip fractures (load bearing vs. load sharing). Seventy patients (more than 55 years old) with trochanteric fracture femur were assessed. Patients were treated with osteosynthesis with dynamic hip screw (DHS) and proximal femoral nailing (PFN). The clinical results were compared between the dynamic hip screw and proximal femoral nailing groups of 35 patients each. All surgeries done on traction table and were followed up at regular intervals of 4 weeks, 6 weeks, 8 weeks, 10 weeks, 12 weeks, 6 months and at 1 year. They observed no statistically significant difference between two groups in view of late & early complications and time to union. They observed significantly better outcomes in PFN group for unstable inter-trochanteric fractures and in unstable fractures reduction loss is significantly lower in PFN group. They concluded that PFN may be the better fixation device for most unstable inter-trochanteric fractures.[11]

CONCLUSION

Under the light of above obtained data, the authors concluded that PFN appears to be an effective line of treatment for treating patients with intertrochanteric fractures.

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