

## Original Article

### **Prognosis of Patients with Intertrochanteric Fractures of Femur Undergoing Treatment with Double Screw Proximal Femoral Nail- A Clinical Study**

Baljit Singh<sup>1</sup>, Gagan Khanna<sup>2</sup>, Kamalpreet Singh<sup>3</sup>, Bhavkaran Singh<sup>4</sup>

<sup>1,2</sup>Professor, <sup>3,4</sup>Junior resident, Department of Orthopedics, Sri Guru Ram Das University of Health Sciences, Sri Amritsar, Punjab, India

#### **ABSTRACT**

**Background:** Hip fractures or fractures of proximal femur are one of the most frequent and appalling fractures affecting the elderly population with 90% occurring in >60 years age group. Hence; we planned the present study to assess the prognosis of patients with intertrochanteric fractures of femur undergoing treatment with double screw proximal femoral nail. **Materials & methods:** The present study included 30 cases of intertrochanteric fractures of skeletally mature adults with two screw proximal femur nail. After obtaining the informed consent, the operative procedure was carried out in all the patients. Patients were discharged after primary operative procedure. Follow up was done for 4 visits in 6 months. At each visit clinical, radiological and functional outcome of the patient was assessed. Outcome in all the patients was assessed in terms of Harris Hip score and Palmer and Parker Score. **Results:** Significant results were obtained while comparing the preoperative and postoperative mean Palmer and Parker score at different time intervals. Significant results were obtained while comparing the preoperative and postoperative mean HHS at different time intervals.

**Conclusion:** PFN is an excellent implant in the management of Inter-trochanteric fractures.

**Key words:** Fracture, Proximal femoral nail

Received: 11 August 2018

Revised: 22 September 2018

Accepted: 25 October 2018

**Corresponding author:** Dr. Kamalpreet Singh, Junior resident, Department of Orthopedics, Sri Guru Ram Das University of Health Sciences, Sri Amritsar, Punjab, India

**This article may be cited as:** Singh B, Khanna G, Singh K, Singh B. Prognosis of Patients with Intertrochanteric Fractures of Femur Undergoing Treatment with Double Screw Proximal Femoral Nail- A Clinical Study. J Adv Med Dent Scie Res 2018;6(10):128-130.

#### **INTRODUCTION**

Hip fractures or fractures of proximal femur are one of the most frequent and appalling fractures affecting the elderly population with 90% occurring in >60 years age group. They comprise femoral neck and intertrochanteric fractures. Before the introduction of suitable fixation devices, treatment of intertrochanteric fractures was non operative, consist of prolonged bed rest in traction until fracture healing occurred followed by a lengthy programme of ambulation training.<sup>1-3</sup> They are also one of the most common fractures encountered in today's orthopaedic practice. Many treatment options are described aiming for stable fixation, which allows early mobilization of the patient as they are unable to even partially restrict weight bearing. The proximal femoral nail (PFN), introduced by

the AO/ASIF group in 1998, has gained widespread popularity for treatment of trochanteric fractures in recent years.<sup>4-6</sup> The advantage of Proximal Femur Nailing fixation is that it provides a more biomechanically stable construct by reducing the distance between hip joint and implant.<sup>7-9</sup> Hence; we planned the present study to assess the prognosis of patients with intertrochanteric fractures of femur undergoing treatment with double screw proximal femoral nail.

#### **MATERIALS & METHODS**

The present study included 30 cases of intertrochanteric fractures of skeletally mature adults with two screw proximal femur nail.

**Inclusion criteria**

- Skeletally mature patients of all age groups having intertrochanteric femur fracture classified as per, AO/OTA classification were included in this study. Both male and female with intertrochanteric fracture of femur were included in the study and were operated upon by surgeon. The groups were randomly allocated.

**Exclusion criteria**

- Terminally ill patients.
- Patients with pathological fractures.
- Patients with previous ipsilateral hip or femur surgery.
- Patients with ipsilateral femur shaft fractures.
- Patients unfit for surgery.

After obtaining the informed consent, the operative procedure was carried out in all the patients. Patients were discharged after primary operative procedure. Follow up was done for 4 visits in 6 months. At each visit clinical, radiological and functional outcome of the patient was assessed. Outcome in all the patients was assessed in terms of Harris Hip score and Palmer and Parker Score. All the results were analyzed by SPSS software. Chi-square test and Mann Whitney U test were used for assessment of level of significance. P-value of less than 0.05 was taken as significant.

**RESULTS**

Mean age of the subjects of the present study was 64.03 years. 43.3 percent of the patients were males. Mean duration of the procedure was 43.86 minutes. Significant results were obtained while comparing the preoperative and postoperative mean Palmer and Parker score at different time intervals. Significant results were obtained while comparing the preoperative and postoperative mean HHS at different time intervals.

Table 1: Mean age of the subjects of both the study groups

Parameter	Double screw
Mean Age (years)	64.03
Standard deviation (SD)	4.82

Table 2: Gender distribution

Gender	Double screw	
	Number	Percentage
Male	13	43.3
Female	17	56.7
Total	30	100

Table 3: Mean duration of procedure among subjects of both the study groups

Parameter	Double screw	
	Mean	SD
Mean duration of procedure (minutes)	43.86	3.37

Table 4: Comparison of mean Palmer And Parker Score among subjects

Mean Palmer And Parker Score	Double screw
Preoperative	0
Postoperative 1 month	3.4
Postoperative 2 month	4.7
Postoperative 3 month	5.5
Postoperative 6 month	8.2

Table 5: Mean HHS among subjects

HHS Score	Double screw
Preoperative	49.23
Postoperative 1 month	60.43
Postoperative 2 month	67.10
Postoperative 3 month	72.96
Postoperative 6 month	78.86

**DISCUSSION**

Intertrochanteric fractures are defined as fractures of proximal part of femur located between lesser and greater trochanter. Peritrochanteric area includes part of femur from extracapsular part of the neck to a point 5 cm distal to lesser trochanter. Weight bearing stress is unequally distributed throughout this area. Koch described that weight bearing force of 1200 pounds per square inch in femur (in a 200 pound man) which is more in medial cortex than in lateral cortex. So medial comminution influences stability of fracture fragments and treatment outcomes.<sup>7-10</sup> Intertrochanteric fracture commonly occurs in elderly patients, but increased mechanization and increased number of road traffic accidents results in this fracture occurring even in younger patients. There are various implants available for managing intertrochanteric fractures till date, but the search is still going on to decide the best method. In the present study, 30 cases of intertrochanteric fractures treated operatively with proximal femoral nail (PFN), and the results were analyzed. Mean age of the patients of the present study was 64.03 years. There were 13 males and 17 females in the present study. We observed a significant improvement in the mean HHS among patients with progressive post-operative time intervals during follow-up (P-value <0.05). Our results were in concordance with the results obtained by James et al, who also reported significant improvement in the HHS postoperatively. Minos Tyllianakis et al in 2004 done a retrospective study of the treatment of unstable intertrochanteric fractures of the proximal femur using proximal femoral nail in 45 patients. In that a fall at home was the commonest mode of injury (67% of the patients). Similarly in our study also slip and fall was the common mode of injury 50 % of patients. In his study the average time from injury to surgery was 3 days (range: 0 to 7 days) which was 7 days in our study. The mean operative time (skin to skin) in our study was 72 minutes compared to 68

minutes in his study. Inger B. Schipper et al 2004 using PFN & gamma nail in 413 patients found superficial infections was 25/413: deep infection in 11/413: hematoma in 17/413. In our study we had 2 patients of deep infection out of that one patient had deep infection on 4th post operative day and it was healed on 22nd post operative day. Another patient had developed pain on the proximal screw suture site and we found to have screw bursitis. Both of them managed with wound debridement, parenteral antibiotics, regular dressings. Overall, good results were observed in our study. Reduction was considered good if the cortical congruence at the calcar region was restored, and if the displacement between the fragments did not exceed 2 mm in any projection. The ideal position for the screw in the femoral neck for the PFN was defined as being central on the lateral radiograph and central or inferior on the AP radiograph.<sup>10-13</sup>

### CONCLUSION

With good understanding of fracture biomechanics, good preoperative planning, accurate instrumentation and surgical technique, PFN is an excellent implant in the management of Inter-trochanteric fractures. However; further studies are recommended.

### REFERENCES

1. Koch JC. The laws of bone architecture. American Journal of anatomy 1917. 2005;21:177.
2. Khan N, Askar Z, Ahmed I. Intertrochanteric fracture of femur; outcome of dynamic hip screw in elderly patients. Prof Med J. 2010;17:328-33
3. Chen LT, Lee JAY, Chua BSY. Hip fractures in the elderly: the impact of comorbid illness on hospitalization costs. Ann Acad Med Singap. 2007;36:784-7.
4. MacEachern AG, Heyse-Moore GH. Stable intertrochanteric femoral fractures. A misnomer?. Journal of Bone and Joint Surgery 1983;65(5):582-3.
5. Smith-Petersen M. Treatment of fractures of the neck of the femur by internal fixation. Surgery Gynaecology and Obstetrics.1937;64:287.
6. Schipper IB, Steyerberg EW, Castelein RM, Van der HF, Den Hoed PT, Kerver AJH et al. Treatment of unstable trochanteric fractures. Journal of bone and joint Surgery.2004;86(B):86-94.
7. Ostrum RF, Marcantonio A, Marburger R. A critical analysis of the eccentric starting point for trochanteric intramedullary femoral nailing. Journal of Orthopaedic Trauma.2005;19(10):681-6.
8. Kulkarni GS, Limaye R, Kulkarni M. Intertrochanteric fractures. Indian J Orthop. 2006;40:16-23.
9. Evans EM. The treatment of trochanteric fractures of the femur. Journal of bone and joint surgery. 1949 ;31B: 190-203.
10. Tyllianakis M, Panagopoulos A, Papadopoulos A, Papisimos S, Mousafiris K. Treatment of extracapsular hip fractures with the proximal femoral nail (PFN): long term results in 45 patients. ActaOrthop Belg. 2004; 70(5):444-54.
11. Schipper Ib, Bresina S, Wahl D, Linke B, Van Vugt Ab, Schneider E. Biomechanical evaluation of the proximal femoral nail. Clinorthoprelat res. 2002; 405:277-86.
12. Ekstram W, Karlsson-Thur C, Larsson S Et Al. Functional Outcome in Treatment of Unstable Trochanteric and Subtrochanteric fractures with the proximal femoral nail and the med off sliding plate. J orthop trauma. 2007; 21:21:18-25.
13. James B et al. Functional outcome of proximal femoral nailing in inter trochanteric fractures of femur: A prospective study. International Journal of Orthopaedics Sciences 2017; 3(2): 513-518.

**Source of support:** Nil

**Conflict of interest:** None declared

This work is licensed under CC BY: **Creative Commons Attribution 3.0 License.**