

## Study of Comparative Analysis of Efficacy of DHS and PFN in Treating Intertrochanteric Fractures of Hip at a Tertiary Care Hospital

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### ABSTRACT

**Aim & Objectives:** The present study was undertaken for comparing the efficacy of dynamic hip screw and proximal femoral nail in treating patients with inter trochanteric fractures of femur.

**Materials & Methods:** A total of 30 patients with history of inter trochanteric fractures of femur were enrolled. All the patients were randomly divided into two study groups: PFN group and DHS group. Patients with history of any systemic illness or presence of any bone metabolic disorder were excluded. All the patients were treated according to their respective groups. Clinico-radiological assessment of the patient was done, and comparison was done. Overall clinical outcome using Modified Hip Score was noted for each patient.

**Results:** Mean radiological union time among the patients of the DHS group and PFN group was 12.6 weeks and 12.8 weeks respectively. Non-significant results were obtained while comparing the mean radiological union time among the patients of both the study groups. Non-significant results were obtained while comparing the mean Harris hip score among the patients of both the study groups. Mean operative time was significantly higher among the patients of the DHS group.

**Conclusion:** For treating patients with inter-trochanteric fractures of femur, both PFN and DHS could be used with equal efficacy. However; PFN was better in terms of shorter duration of procedure.

**Key words:** Dynamic Hip Screw, Inter-Trochanteric Fractures, Proximal Femoral Nail.


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### INTRODUCTION

Hip fractures include mainly trochanteric and femoral neck fractures, and the former was reported with a mortality rate ranging from 15% to 30%. Surgical treatment with stable fixation allows early mobilization and reduces complications. There are two main types of fixations for trochanteric fractures, which are plate fixation and intramedullary implants. Dynamic hip screw (DHS) or sliding hip screw (SHS) has been the standard implant in treating trochanteric fractures. However, when compared with the intramedullary implants, it has a biomechanical disadvantage because of a wider distance between the weight bearing axis and the implants.<sup>1-3</sup> The proximal femoral nail (PFN) introduced by the AO/ASIF group in 1998 has become prevalent in treating trochanteric fractures in recent years. Although there were several reports showing benefits of proximal femoral nail, it was still associated with technical failure. The goal of treatment is restoring mobility safely and efficiently, while minimizing the risk of medical complications and technical failure. Restoration of mobility depends on the quality of bone and the type of implant used. The

incidence of failure with unstable IT fractures is as high as 50% and the cut-out rate can be as high as 8% for hip screws.<sup>4-6</sup> Hence; the present study was undertaken for comparing the efficacy of dynamic hip screw and proximal femoral nail in treating patients with inter trochanteric fractures of femur.

### MATERIALS & METHODS

The present study was undertaken in the Department of Orthopaedics, Glocal Medical College Super Specialty Hospital and Research Centre, Saharanpur, Uttar Pradesh (India) for comparing the efficacy of dynamic hip screw and proximal femoral nail in treating patients with inter trochanteric fractures of femur. A total of 30 patients with history of inter trochanteric fractures of femur were enrolled. All the patients were randomly divided into two study groups: PFN group and DHS group. Patients with history of any systemic illness or presence of any bone metabolic disorder were excluded. All the patients were treated according to their respective groups. Clinico-radiological assessment of the

patient was done, and comparison was done. Overall clinical outcome using Modified Hip Score was noted for each patient. All the results were analysed by SPSS software. Chi- square test, Mann- Whitney U 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 DHS group, 2 patients, 5 patients, 6 patients and 4 patients belonged to the age group of 21 to 40 years, 41 to 60 years, 61 to 80 years and more than 80 years respectively. In the PFN group,

3 patients, 4 patients, 5 patients and 3 patients belonged to the age group of 21 to 40 years, 41 to 60 years, 61 to 80 years and more than 80 years respectively. Majority of the patients of both the study groups were males. Mean radiological union time among the patients of the DHS group and PFN group was 12.6 weeks and 12.8 weeks respectively. Non-significant results were obtained while comparing the mean radiological union time among the patients of both the study groups. Non-significant results were obtained while comparing the mean Harris hip score among the patients of both the study groups. Mean operative time was significantly higher among the patients of the DHS group.

**Table 1: Distribution of subjects according to age**

Age group	DHS group	PFN group
21- 40	2	3
41- 60	5	4
61- 80	6	5
81 and above	4	3
<b>Total</b>	<b>15</b>	<b>15</b>

**Table 2: Radiological union time (weeks)**

Radiological union time	DHS group	PFN group
Mean	12.6	12.8
SD	2.3	2.4
p- value	0.26	

**Table 3: Comparison of mean HHS among DHS and PFN group patients**

Group	Mean HHS	SD	P- value
Group 1	87.18	12.58	0.88
Group 2	84.96	13.42	

**Table 4: Comparison of operative time**

Operative time (minutes)	DHS group	PFN group
Mean	132.8	96.4
SD	23.8	17.5
p- value	0.00 (Significant)	

## DISCUSSION

Intertrochanteric fractures are common injuries occurring predominantly as low-energy injuries in the elderly, mostly due to direct injury to hip (e.g. fall). Since the 1800s, a lot has changed in the way these fractures are managed. From conservative treatment (including hip spica and pin traction) with bed rest, to the operative fixation with modern surgical techniques and implants, we have come a long way. Early attempts at surgical management were marred by poor asepsis, lack of intraoperative imaging, poor implant design and quality, and incomplete understanding of fracture mechanics. Langenbeck was the first to internally fix an intertrochanteric fracture with a nail. The modern era of hip fracture fixation began in 1925 when Smith Peterson

introduced a triflanged nail. The real benefit of fixation lies not in improving union rates (intertrochanteric fractures rarely go into nonunion, even when treated conservatively), but in improving functional outcome and mortality rates, which are attributed to the early mobilization and better nursing care possible after surgery.<sup>6-10</sup> Hence; the present study was undertaken for comparing the efficacy of dynamic hip screw and proximal femoral nail in treating patients with inter trochanteric fractures of femur.

In the DHS group, 2 patients, 5 patients, 6 patients and 4 patients belonged to the age group of 21 to 40 years, 41 to 60 years, 61 to 80 years and more than 80 years respectively. In the PFN group, 3 patients, 4 patients, 5 patients and 3 patients belonged to the

age group of 21 to 40 years, 41 to 60 years, 61 to 80 years and more than 80 years respectively. Majority of the patients of both the study groups were males. Mean radiological union time among the patients of the DHS group and PFN group was 12.6 weeks and 12.8 weeks respectively. Huang X et al assessed whether the proximal femoral nail was better than the dynamic hip screw in the treatment of trochanteric fractures with respect to operation time, blood transfusion, hospital stay, wound complications, number of reoperation, and mortality rate. Compared with DHS fixation, PFN fixation had similar operation time (95% CI: -15.28-2.40, P = 0.15). Blood loss and transfusion during perioperative time were also comparable between the two fixations. Outcomes of hospital stay, wound complication, mortality, and reoperation were all similar between the two groups. PFN fixation shows the same effectiveness as DHS fixation in the parameters measured.<sup>10</sup>

In the present study, non-significant results were obtained while comparing the mean radiological union time among the patients of both the study groups. Non-significant results were obtained while comparing the mean Harris hip score among the patients of both the study groups. Mean operative time was significantly higher among the patients of the DHS group. Mansukhani SA et al compared the intraoperative and postoperative parameters using the Dynamic Hip Screw (DHS), the Cemented Bipolar Hemiarthroplasty (BH) and the Proximal Femoral Nail (PFN) for the management of unstable IT fractures. Fifty patients, having unstable IT fractures with age more than 60 years were randomly selected and were followed up averagely for 19 months (12- 30 months). The type of implant for a particular patient and a particular type of fracture was randomly selected, and the same surgical team treated all patients. Total number of 19 patients were operated using the DHS (Group-1), 13 using the BH (Group-2) and 18 using the PFN (Group-3). All patients in the three groups were compared in terms of preoperative, intraoperative and postoperative parameters and functionally assessed using the Harris hip score and the mobility score of Parker and Palmer. Patients operated using the PFN had significantly lower mean blood loss as compared to the other two groups. The mean days to unaided Full Weight Bearing (FWB) was significantly higher in patients treated by the DHS as compared to the other two groups. All three groups were comparable in terms of functional assessment. Treatment of unstable IT fracture of femur is a matter open to debate. IT fractures of elderly must be treated with considering the age of the patient, mental status, bone quality, and the type of fracture.<sup>11</sup>

## CONCLUSION

The authors conclude that for treating patients with intertrochanteric fractures of femur, both PFN and DHS could be used with equal efficacy. However, PFN was better in terms of shorter duration of procedure.

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