

## Original Research

### Comparative evaluation of efficacy of proximal femoral nail and dynamic hip screw among patients with intertrochanteric hip fractures

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#### ABSTRACT:

**Background:** Hip fracture contributes to both morbidity and mortality in the elderly. Therefore; we conducted this comparative to investigate whether there is a significant difference between PFN and DHS fixation in treatment of intertrochanteric fractures. **Materials & methods:** A total of 20 patients with fracture inter-trochantric femur were taken for evaluation of DHS v/s PFN with 10 patients in each group. Ethical clearance was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. Patients were given post-op antibiotics for adequate duration. All patients were regularly followed up in OPD. Clinico-radiological assessment of the patient was done and comparison was done in terms of duration of surgery and Harris hip score. All the results were analysed by SPSS software. **Results:** Mean duration of surgery among the patients of the DHS group and PFN group was 66.8 minutes and 56.8 minutes respectively. Mean Harris hip score among the patients of the DHS group and PFN group was 84.5 and 85.1 respectively. Non-significant results were obtained while comparing the mean Harris hip score among the patients of the two study groups. **Conclusion:** Both PFN and DHS are equally effective in terms of clinical outcome. However; PFN group has shorter duration of surgery.

**Key words:** Dynamic hip screw, Proximal femoral nail

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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.<sup>1</sup>

Proximal femoral Fractures account for a large proportion of hospitalization among trauma cases. An overwhelming majority of these patients (>90%) are aged above 50 years. In younger patients, proximal femoral fractures are usually the result of high energy physical trauma and usually occur in the absence of disease. Inter-trochanteric and femoral neck fractures account for 90% of the proximal femoral fractures occurring in elderly patients.<sup>2-4</sup>

Generally, intramedullary fixation and extramedullary fixation are the 2 primary options for treatment of such fractures. The dynamic hip screw (DHS), 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.<sup>5-7</sup>

Therefore; we conducted this comparative to investigate whether there is a significant difference between PFN and DHS fixation in treatment of intertrochanteric fractures.

#### MATERIALS & METHODS

The present prospective study was conducted in the department of orthopaedics of medical institute and it included assessment of patients of inter-trochanteric fractures attending out-patient department and emergency of orthopaedics. A total of 20 patients with fracture inter-trochantric femur were taken for evaluation of DHS v/s

PFN. Ethical clearance was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. Evaluation of the patient was started with general physical examination and local examination to rule out any neurovascular deficit or compartment syndrome. The operation was carried out with the patient lying supine on fracture table. Length and size of nail was decided depending upon fracture pattern and individual bone characteristics. Patients were given post-op antibiotics for adequate duration. All patients were regularly followed up in OPD. Clinicoradiological assessment of the patient was done and comparison was done in terms of duration of surgery and Harris hip score. All the results were analyzed 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**

A total of 20 patients were analysed. Mean age of the patients of the DHS group and PFN group was 48.4 years and 45.2 years respectively. 70 percent of the patients of DHS group were males while remaining were females. 80 percent of the patients of PFN group were males while remaining were females. Mean duration of surgery among the patients of the DHS group and PFN group was 66.8 minutes and 56.8 minutes respectively. Mean Harris hip score among the patients of the DHS group and PFN group was 84.5 and 85.1 respectively. Non-significant results were obtained while comparing the mean Harris hip score among the patients of the two study groups.

**Table1:** Distribution of subjects according to age

Age group (years)	DHS group		PFN group	
	Number of patients	Percentage	Number of patients	Percentage
Less than 40	1	10	2	20
40 to 60	5	50	4	40
61 to 80	4	40	4	40
<b>Total</b>	<b>10</b>	<b>100</b>	<b>10</b>	<b>100</b>

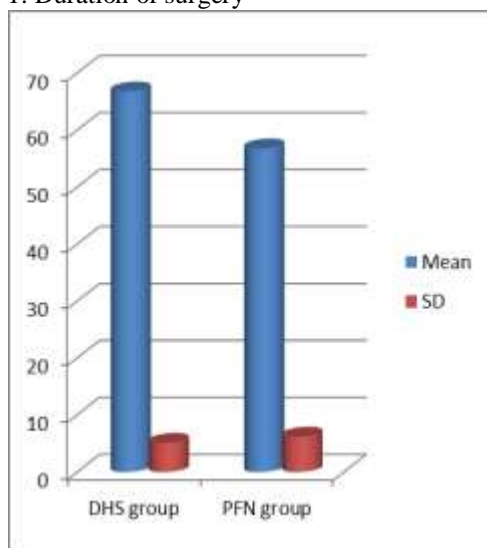
**Table 2:** Distribution of subjects according to gender

Gender	DHS group		PFN group	
	Number of patients	Percentage	Number of patients	Percentage
Males	7	70	8	80
Females	3	30	2	20
<b>Total</b>	<b>10</b>	<b>100</b>	<b>10</b>	<b>100</b>

**Table 3:** Mean duration of surgery

Duration of surgery	DHS group	PFN group	p-value
<b>Mean</b>	66.8	56.8	0.00
<b>SD</b>	5.12	6.22	

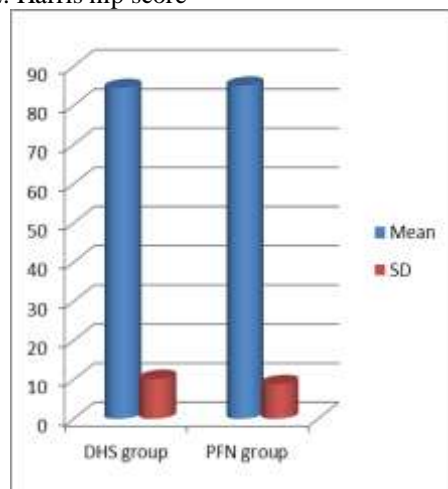
**Graph 1:** Duration of surgery



**Table 4:** Harris hip score

Harris hip score	DHS group	PFN group	p-value
<b>Mean</b>	84.5	85.1	0.88
<b>SD</b>	10.2	8.9	

**Graph 2:** Harris hip score



## DISCUSSION

The goal of treatment of these fractures is stable fixation, which allows early mobilization of the patient. These fractures are associated with substantial morbidity and mortality. Associated co-morbid medical problem like diabetes, hypertension, pulmonary, renal and cardiac problems add to the insult of the fracture. Elderly patients are threatened with life-threatening complications such as hypostatic pneumonia, catheter sepsis, cardio respiratory failure and decubitus ulcer. All the circumstances mentioned above require using an urgent surgical solution for early rehabilitation and mobilization of the patient.<sup>8</sup> Therefore; we conducted this comparative to investigate whether there is a significant difference between PFN and DHS fixation in treatment of intertrochanteric fractures.

In the present study, 20 patients were analysed. Mean age of the patients of the DHS group and PFN group was 48.4 years and 45.2 years respectively. 70 percent of the patients of DHS group were males while remaining were females. 80 percent of the patients of PFN group were males while remaining were females. 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.<sup>9</sup>

In the present study, mean duration of surgery among the patients of the DHS group and PFN group was 66.8 minutes and 56.8 minutes respectively. 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.<sup>10</sup>

In the present study, mean Harris hip score among the patients of the DHS group and PFN group was 84.5 and 85.1 respectively. Non-significant results were obtained while comparing the mean Harris hip score among the patients of the two study groups. Singla G et al 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.<sup>11</sup>

## CONCLUSION

Both PFN and DHS are equally effective in terms of clinical outcome. However; PFN group has shorter duration of surgery.

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