

Comparative Evaluation of Outcome of PFN and DHS Fixation in Treatment of Intertrochanteric Fractures at a Tertiary Care Centre

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ABSTRACT

Background: To investigate whether there is a significant difference between PFN and DHS fixation in treatment of intertrochanteric fractures.

Materials & Methods: A total of 40 patients with fracture intertrochanteric femur was taken for evaluation of DHS v/s PFN after fulfilling the inclusion criteria. All the patients in the present study were divided broadly into two study group with 20 patients in each group. For DHS, fracture was exposed by lateral approach. With the aid of image intensifier, the guide pin was inserted into femoral head and neck in the appropriate site followed by insertion of DHS. A suitable side plate with at least 4 holes distal to main fracture line was engaged to the hip lag screw and secured proximally and distally. For PFN, after closed reduction and checked under image intensifier, a 5-cm incision was initially made from the cranial part of the greater trochanter. Clinicoradiological assessment of the patient was done and comparison was done. All the results were analyzed by SPSS software.

Results: Mean HHS among the patients of DHS group and the PFN group were found to be 83.2 and 84.28 respectively.

No- Significant results were obtained while comparing the mean HHS in between the DHS group and the PFN group (P-value > 0.05).

Conclusion: Similar results were obtained while comparing the patients of the two study groups.

Key words: Fracture, PFN, DHS.


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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. Proximal femoral Fractures account for a large proportion of hospitalization among trauma cases. Each of these fracture types require special methods of treatment and have their own set of complications and controversies regarding the optimal method of management. Inter trochanteric fractures of femur occur in the area between the greater and lesser trochanter and may involve these two structures.^{1,2} In younger patients, proximal femoral fractures are usually the result of high energy physical trauma and usually occur in the absence of disease. Incidence of proximal femoral fractures among females is 2 to 3 times higher than males, also the risk of sustaining a proximal femoral fracture doubles every 10 years after age 50 years. The goal of treatment of these fractures is stable fixation, which allows early mobilization of the patient.³⁻⁶

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.⁶⁻⁹ 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 patients of inter-trochanteric fractures attending out-patient department and

emergency of orthopaedics. A total of 40 patients with fracture intertrochanteric femur was taken for evaluation of DHS v/s PFN after fulfilling the inclusion criteria. All the patients in the present study were divided broadly into two study group with 20 patients in each group. The first group was DHS group, which included subjects in which DHS implants were placed, while the other group included the PNF group, which included subjects in which PNF implants were placed. Evaluation of the patient was started with general physical examination and local examination to rule out any neurovascular deficit or compartment syndrome. For DHS, fracture was exposed by lateral approach. With the aid of image intensifier, the guide pin was inserted into femoral head and neck in the appropriate site followed by insertion of DHS. A suitable side plate with at least 4 holes distal to main fracture line was engaged to the hip lag screw and secured proximally and distally.

For PFN, after closed reduction and checked under image intensifier, a 5-cm incision was initially made from the cranial part of the greater trochanter. Entry portal made at the tip of greater trochanter using the awl after checking under image intensifier and a guide wire was passed through the trochanter distally, followed by trochanteric reaming over the guide wire. The nail was implanted manually to suit the Indian femora. All patients were regularly followed up in OPD at an interval of 2 weeks till full weight bearing is started and then after an interval of 4 weeks. Clinicoradiological assessment of the patient was done, and comparison was done.

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.

Table 1: Distribution of patients of DHS group and PNF group according to radiological callus formation after 18 weeks

Radiological callus	DHS		PNF	
	No. of patients	%	No. of patients	%
Minimal union observed	3	15	0	0
No union observed	0	00	2	10
Union observed	17	85	18	90
Total	20	100	20	100

Table 2: Complications among patients of DHS group and PNF group

Type of Complication	DHS		PNF	
	No. of patients	%	No. of patients	%
Skin puckering with superficial infection	1	5	0	0
Z- effect at one month (Non- union)	0	0	1	5
None	19	95	19	95

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

Group	Mean HHS	SD	P- value
DHS	83.20	4.25	0.178
PFN	84.28	4.89	

RESULTS

Mean age of the patients of the PFN and DHS group was 53.5 years and 58.1 years respectively. Majority of the patients of both the study group were males. In the DHS group, union occurred on radiological examination after 18 weeks in 17 (85%) patients while minimal union occurred in 3 (15%) patients. In the PNF group, no union occurred on radiological examination after 18 weeks in 2 (10%) patients while minimal union and complete occurred in 0 (0%) patients and 18 (90%) patients respectively. In the DHS group, skin puckering with superficial infection was seen in 1 (5%) patient while in the PNF group Non- union occurred in 1 (5%) patient. Mean HHS among the patients of DHS group and the PFN group were found to be 83.2 and 84.28 respectively. No-Significant results were obtained while comparing the mean HHS in between the DHS group and the PFN group (P- value > 0.05).

DISCUSSION

In the present study, Majority of the patients of both the study group were males. In the DHS group, union occurred on radiological examination after 18 weeks in 17 (85%) patients while minimal union occurred in 3 (15%) patients. In the PNF group, no union occurred on radiological examination after 18 weeks in 2 (10%) patients while minimal union and complete occurred in 0 (0%) patients and 18 (90%) patients respectively. In the DHS group, skin puckering with superficial infection was seen in 1 (5%) patient while in the PNF group Non- union occurred in 1 (5%) patient. Ramakrishnan M (2004) reported their initial experience with a new reconstruction nail, the long proximal femoral nail (L.PFN), in the treatment of subtrochanteric femoral fractures and metastases. We performed 52 L.PFN in 49 patients over a period of 18 months with an average follow-up period of 47.7 weeks.

Group I consisted of 24 patients, who had L.PFN for traumatic subtrochanteric femoral fractures. Group II consisted of 25 patients, who had L.PFN for femoral metastases and pathological fractures. (Three bilateral.) In nine patients in group I, the fracture was extending to the intertrochanteric region with involvement of the piriformis fossa. Eight patients in group I had open reduction and cerclage cabling of the fracture prior to L.PFN. All the traumatic fractures in group I had united with an average time to union of 19.4 weeks. In eight operations there were technical difficulties with the insertion of proximal locking screws. Five patients in our series had complications but we had no mechanical failures of the implant. L.PFN is a reliable implant for subtrochanteric femoral fractures and metastases.¹⁰

Mean HHS among the patients of DHS group and the PFN group were found to be 83.2 and 84.28 respectively. No- Significant results were obtained while comparing the mean HHS in between the DHS group and the PFN group (P- value > 0.05). A prospective study comparing the outcome of proximal femoral nail (PFN) and dynamic hip screw (DHS) fixation of 70 unstable intertrochanteric fractures concluded that proximal femoral nail (PFN) may be used successfully in the fixation of unstable fractures with similar results to the dynamic hip screw (DHS) for mobility at 6 months. Proximal femoral nail (PFN) was associated with reduced blood loss, shorter hospital stays and less morbidity compared with dynamic hip screw (DHS).¹¹ Pavelka T et al (2005) presented analysis of complications of the treatment of unstable fractures of the proximal femur by the proximal femoral nail (PFN Synthes). 239 patients were treated for unstable fractures of the proximal femur, 89 men and 150 women, average age 71 years. The minimum follow-up was 12 months. Unstable was considered a fracture in which it was impossible to restore by reduction the medial support -- the Adams' arch, i. e. the region below the lesser trochanter in subtrochanteric fractures. Prevailing in the group of patients were unstable peritrochanteric fractures (AO 31 A2.1, A2.2) that occurred in 55 % of patients, per-subtrochanteric fractures (AO 31 A2.3) accounted only for 26 % and subtrochanteric fractures (AO 31 A3.3) for 19 %. The fracture healed in 95 % of patients within 6 months and in 98 % of patients within 9 months. There were 29 intraoperative complications recorded in 19 patients. From the results, the authors concluded that the most frequent mistake is reduction with the persisting varus position or distraction in the fracture line, incorrect placement of the screw in the femoral neck or the nail in the femoral shaft, wrong choice of the length of the screws, unnecessary hesitation in solving the defect in the course of the treatment. Forced insertion of the implant may cause additional damages to the skeleton. PFN is a quality implant for the treatment of unstable peritrochanteric and subtrochanteric fractures of the femur.¹²

CONCLUSION

Similar results were obtained while comparing the patients of the two study groups.

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