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Original ARTICLE

Efficacy of dynamic hip screw and proximal femoral nail in treating patients with inter trochanteric fractures of femur

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***ABSTRACT*:**
Background: 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 20 patients with history of inter trochanteric fractures of femur were enrolled. Randomization was done and all the patients were divided broadly into two study groups with 10 patients in each group as follows: Group 1: Patients treated with PFN, and Group 2: Patients treated with DHS. Pre-operative planning was done to decide the type and length of implant to be used. All the patients were treated according to their respective groups. All the surgeries were carried out under the hands of skilled and experienced orthopaedic surgeons. 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. **Results:** Mean time for complete radiological union among the patients of group 1 and group 2 was 12.81 weeks and 12.19 weeks respectively. Non-significant results were obtained while comparing the mean time for complete radiological union. Mean HHS among the patients of group 1 was 86.12 while among the patients of group 2 was 85.33 respectively. While comparing the mean HHS among the patients of both the study groups, non-significant results were obtained. **Conclusion:** For treating patients with inter-trochanteric fractures of femur, both PFN and DHS could be used with equal efficacy.
Key words: Dynamic hip screw, Inter-trochanteric fractures, Proximal femoral nail

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INTRODUCTION

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. The incidence of these fractures is 2–3 times more in females as compared to male population.[1- 3] They are classified on basis of anatomical location of fracture into:

- Neck of femur fracture,
- Inter trochanteric fracture and
- Subtrochanteric fracture.

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. Inter trochanteric (I/T) fractures can be classified in many ways viz. Evan's classification, AO classification, Jenson's classification all of them divide this fracture into stable fractures and unstable fractures (reverse oblique and coronal split fractures).[4]

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.[5]

Unstable inter trochanteric fractures are notorious for their complications and high failure rates following treatment with conventional dynamic hip screw (DHS). Proximal femoral nail (PFN) and Gamma nail are 2 commonly used devices in the intramedullary fixation.[6] 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

With the aim of assessing and comparing the T efficacy of dynamic hip screw and proximal femoral nail in treating patients with inter trochanteric fractures of femur, the present study was planned. A total of 20 patients with history of inter trochanteric fractures of femur were enrolled and written consent was obtained from all of them after explaining in detail the entire research protocol. Randomization was done and all the patients were divided broadly into two study groups with 10 patients in each group as follows:

Group 1: Patients treated with PFN

Group 2: Patients treated with DHS

Inclusion Criteria:

1. Closed inter-trochanteric fracture.
2. Patients of more than 18 years of age
3. Patients with absence of compound fractures

Complete clinical and demographic details of all the patients were obtained. Clinical examination of all the patients was carried out and details were recorded in a Performa. Pre-operative planning was done to decide the type and length of implant to be used. All the patients were treated according to their respective groups. All the surgeries were carried out under the hands of skilled and experienced orthopaedic surgeons. Clinico-radiological assessment of the patient was done and comparison was done. Overall clinical outcome using Modified Hip Score was noted for each patient.[6] 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 present study, a total of 20 patients with inter-trochanteric fractures of femur were analysed. Mean age of the patients of the Group 1 and group 2 was found to be 72.1 years and 70.3 years respectively. 70 percent of the patients of group 1 and 60 percent of the patients of group 2 belonged to age group of more than 60 years. 80 percent of the patients of group 1 and 70 percent of the patients of group 2 were males while the remaining were females. In the present study, Mean time for complete radiological union among the patients of group 1 and group 2 was 12.81 weeks and 12.19 weeks respectively. Non-significant results were obtained while comparing the mean time for complete radiological union. In the present study, mean HHS among the patients of group 1 was 86.12 while among the patients of group 2 was 85.33 respectively. While comparing the mean HHS among the patients of both the study groups, non-significant results were obtained.

DISCUSSION

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.[6- 8] 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.

Table 1: Distribution of subjects according to age

Age group	Group 1		Group 2	
	Number of patients	Percentage	Number of patients	Percentage
21- 40	1	10	2	20
41- 60	2	20	2	20
61- 80	4	40	3	30
81 and above	3	30	3	30
Total	10	100	10	100

Table 2: Distribution of subjects according to gender

Gender	Group 1		Group 2	
	Number of patients	Percentage	Number of patients	Percentage
Males	8	80	7	70
Females	2	20	3	30
Total	10	100	10	100

Table 3: Comparison of complete radiological union time

Radiological Union	Group 1		Group 2		p-value
	Number	Percentage	Radiological Union	Percentage	
10-14 WEEKS	9	64.3	10	71.4	0.82
14-18 WEEKS	5	35.7	4	29.6	
Mean (Weeks)	12.81		12.19		0.39

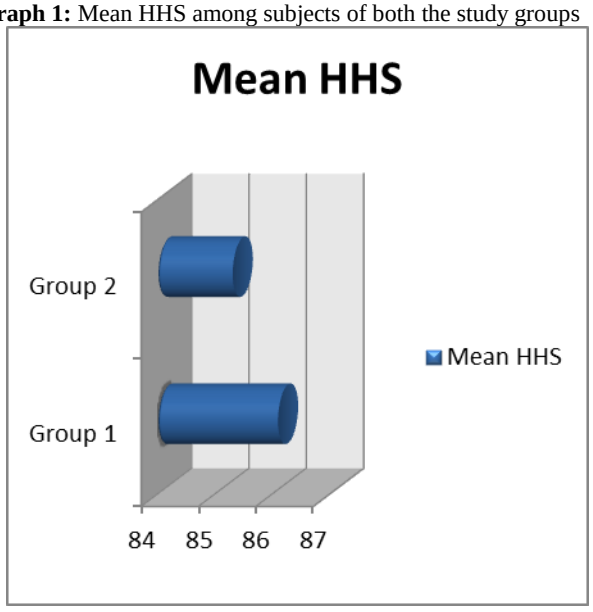
Table 4: Comparison of mean HHS among DHS and PFN group patients

Group	Mean HHS	SD	P- value
Group 1	86.12	11.72	0.88
Group 2	85.33	10.36	

In the present study, a total of 20 patients with inter-trochanteric fractures of femur were analysed. Mean age of the patients of the Group 1 and group 2 was found to be 72.1 years and 70.3 years respectively. 70 percent of the patients of group 1 and 60 percent of the patients of group 2 belonged to age group of more than 60 years. 80 percent of the patients of group 1 and 70 percent of the patients of group 2 were males while the remaining were females. A retrospective study of 129 patients comparing proximal femoral nail (PFN) and Dynamic hip screw (DHS) concluded radiological results were equally good. 6 revisions were necessary in the case of the Dynamic hip screw (DHS) with trochanteric stabilization

plate (TSP) and 4 in the case of proximal femoral nail (PFN). A significantly shorter operation time (44.3 vs. 57.3 min) and a considerably shorter in patient stay (18.6 vs 21.3 days) were common with proximal femoral nail (PFN). The full weight bearing ambulation immediately after the operation was possible for 97% of the proximal femoral nail (PFN) patients and 88% of the Dynamic hip screw (DHS) patients. In a follow-up 6 months after the operation, the proximal femoral nail (PFN) patients displayed significantly lower pain intensity in the operated leg at the same score for ambulation and the same subjective degree of satisfaction. They concluded that unstable pertrochanteric and subtrochanteric femoral comminuted fractures can be treated just as well with proximal femoral nail (PFN) as with dynamic hip screw DHS and trochanteric stabilization plate (TSP).[8]

Graph 1: Mean HHS among subjects of both the study groups



In the present study, Mean time for complete radiological union among the patients of group 1 and group 2 was 12.81 weeks and 12.19 weeks respectively. Non-significant results were obtained while comparing the mean time for complete radiological union. A prospective study comparing the outcome of **proximal femoral nail (PFN)** and dynamic hip screw (DHS) fixation of 70 unstable intertrochantaric 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 stay and less morbidity compared with dynamic hip screw (DHS).[9]

In the present study, mean HHS among the patients of group 1 was 86.12 while among the patients of group 2 was 85.33 respectively. While comparing the mean HHS among the patients of both the study groups, non-significant results were obtained. Khan et al in 2004 compared the outcome of PFN and DHS fixation of unstable proximal femoral fractures in 70 patients. Operation duration was similar in two groups although blood loss was significantly low in PFN group (PFN-200 mls, DHS: 375 mls). There was a significant difference in length of hospital stay (PFN: 8 days, DHS: 14 days) radiographic signs of fracture healing at 3 months were 88% in PFN and 83% in DHS. 3 Paients in DHS group suffered failure of fixation with screw cutout. There was no implant failures or failures of fixation in PFN groups. At 3 months, PFN follow-up mobility was greater in the PFN group. At 6 months, both groups showed similar mobility. Persistant severe hip pain at 6 months was PFN 3% and DHS 9%.[10]

CONCLUSION

From the above results, the authors conclude that for treating patients with inter-trochanteric fractures of femur, both PFN and DHS could be used with equal efficacy. However; further studies are recommended for better exploration of results.

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