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ORIGINAL ARTICLE

Proximal Femoral Nail vs. Dynamic Hip Screw in Treatment of Intertrochanteric Fractures: A comparative study

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ABSTRACT:

Background: The present study was conducted for comparing the efficacy of Proximal Femoral Nail vs. Dynamic Hip Screw in Treatment of Intertrochanteric Fractures. **Materials & methods:** A total of 40 patients with fracture inter-trochantric femur will be 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. All the patients were treated according to respective study groups. Patients were given post-op antibiotics for adequate duration. Follow-up was done. **Results:** Mean time of early mobilization till weight bearing in the DHS group and the PFN group were found to be 18.5 and 12.9 respectively. Significant results were obtained while comparing the mean time of early mobilization till weight bearing in between DHS group and PFN group (P-value < 0.05). **Conclusion:** Our results suggest that the use of the proximal femoral nail may allow a faster post-operative restoration of walking ability, when compared with the dynamic hip screw.

Key words: Proximal Femoral nail, Dynamic hip screw

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INTRODUCTION

Hip fractures represent a common type of injuries; its number increases rapidly. By 2050, the number of hip fractures is estimated to surpass 6.3 million. The 1-year mortality for hip fractures range from 14% to 36%. Hip fractures include femoral neck and intertrochanteric factures; 20 to 30 percent of patients died in the first 12 months after an intertrochanteric fracture, especially those elderly with limited activity. Surgical treatment represents the optimal strategy for managing intertrochanteric fractures. It allows early rehabilitation and functional recovery, and reduces the risk of postoperative complications.[1-3]

Internal fixation is a most common surgical treatment for intertrochanteric fractures, and intramedually (nails) and extramedually (screws or plates) fixations are two commonly used approaches. The established benefits of internal fixation treatments are immediate pain relief, rapid mobilization, accelerated rehabilitation and maintenance of independent living.[4, 5]

The dynamic hip screw (DHS) with trochanteric stabilisation plate (TSP) as the extramedullary power transmission system and the proximal femur nail (PFN) as the means of intramedullary stabilisation are both standard in the treatment of unstable trochanteric femoral fractures in the case of old people.[5- 7] Hence; the present study was conducted for comparing the efficacy of Proximal Femoral Nail vs. Dynamic Hip Screw in Treatment of Intertrochanteric Fractures.

MATERIALS & METHODS

The present study was conducted for comparing the efficacy of Proximal Femoral Nail vs. Dynamic Hip Screw in Treatment of Intertrochanteric FracturesA total of 40 patients with fracture inter-trochantric femur will be 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.

INCLUSION CRITERIA

1. Closed inter-trochanteric fracture.
2. Age > 18 years (skeletal maturity)
3. Time < 2 weeks.
4. Patient Willing

EXCLUSION CRITERIA

1. Age < 18 years. (skeletal immaturity)
2. Time > 2 weeks.
3. Associated Fracture neck femur.

Evaluation of the patient was started with general physical examination and local examination to rule out any neurovascular deficit or compartment syndrome. Pre-operative antibiotics are given to the

patients. Pre-operative planning will be done to decide the type and length of implant to be used. The choice of anaesthesia will be general or regional.The operation was carried out with the patient lying supine on fracture table. Traction was used for reduction and realignment of comminuted fracture and reduction was assessed by image intensifier. All the patients were treated according to respective study groups. Patients were given post-op antibiotics for adequate duration. All patients will be 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. Clinico-radiological 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.

RESULTS

A total of 40 subjects were included in the present study, out of which, 20 underwent DHS treatment while the remaining 20 underwent PFN treatment. Mean age of the DHS and PFN group patients was 52.1 and 49.7 years respectively. Majority proportion of patients of both the study groups were males. Among the patients of the DHS group, fall and RSA were the mode of trauma among 60% and 40% patients respectively. In the patients of the PFN group, fall and RSA were responsible for trauma in 65% and 35% patients respectively. Mean time of early mobilization till weight bearing in the DHS group and the PFN group were found to be 18.5 and 12.9 respectively. Significant results were obtained while comparing the mean time of early mobilization till weight bearing in between DHS group and PFN group (P- value < 0.05).

Table 1: Variables

Parameter	DHS	PFN	p- value
Duration of Surgery (minutes)	65.3	68.1	0.71
Total amount of blood loss (ml)	356.1	212.8	0.00*
Duration of hospital stay (days)	13.5	12.4	0.39
Total Harris Hip Score	83.6	85.4	0.85

*: Significant

Table 2: Comparison of time of early mobilization till weight bearing in between the DHS and PFN group

Group	Time of early mobilization till weight bearing	SD	P- value
DHS	18.5	7.55	0.000
PFN	12.9	7.69	

DISCUSSION

Intramedullary nailing (IM) has recently become a popular method of stabilisation of proximal femoral fractures in adults. The proposed advantages include a short incision, less operative time, minimal blood loss and rapid rehabilitation of the elderly patient, which is essential to minimize the risk of medical complications. Several studies have shown the superiority of IM nailing in this respect compared to other methods of fixation such as plate fixation. Optimal positioning of nail devices is of paramount importance for a good outcome, reducing the risk of complications. Complications described with intramedullary devices include fracture propagation, difficulties with interlocking, jamming of the compression screw within the nail, and cut-out and cut-off of the lag screw.The methods of intramedullary nailing, with similar biomechanical principles, differ primarily with the need for diaphyseal reaming and the use of anti-rotation systems in fixing the femoral neck. The literature comparing the efficacy of these two implants remains obscure.[8- 10]Hence; the present study was conducted for comparing the efficacy of Proximal Femoral Nail vs. Dynamic Hip Screw in Treatment of Intertrochanteric Fractures.

A total of 40 subjects were included in the present study, out of which, 20 underwent DHS treatment while the remaining 20 underwent PFN treatment. Mean age of the DHS and PFN group patients was 52.1 and 49.7 years respectively. Majority proportion of patients of both the study groups were males. Among the patients of the DHS group, fall and RSA were the mode of trauma among 60% and 40% patients respectively. In the patients of the PFN group, fall and RSA were responsible for trauma in 65% and 35% patients respectively. Pajarinen Jet al treated 108 patients with a pertrochanteric femoral fracture using either the dynamic hip screw or the proximal femoral nail in this prospective, randomised series. They compared walking ability before fracture, intra-operative variables and return to their residence. Patients treated with the proximal femoral nail (n = 42) had regained their pre-operative walking ability significantly (p = 0.04) more often by the four-month review than those treated with the dynamic hip screw (n = 41). Peri-operative or immediate post-operative measures of outcome did not differ between the groups, with the exception of operation time. The dynamic hip screw allowed a significantly greater compression of the fracture during the four-month follow-up, but consolidation of the fracture was comparable between the two groups. Two major losses of reduction were observed in each group, resulting in a total of four revision operations.[11]

In the present study, mean time of early mobilization till weight bearing in the DHS group and the PFN group were found to be 18.5 and 12.9 respectively. Significant results were obtained while comparing the mean time of early mobilization till weight bearing in between DHS group and PFN group (P-value < 0.05).Boldin C et al treated 55 patients having proximal femoral fractures with the PFN from 1997 to 2000. In 34 patients, they achieved what was close to anatomic reduction of the main fracture fragments. Immediate full weight bearing was permitted in 49 patients. During the follow-up period of 15 months, complications occurred in 12 patients. 2 patients had a cut-out of the implant because we used too short proximal gliding screws. In 5 patients, closed fracture reduction could not be done and open fracture reduction with use of cerclage became necessary. Careful surgical technique and modification of the PFN can reduce the high complication rate. In conclusion, the PFN is a good minimal invasive implant of unstable proximal femoral fractures, if closed reduction is possible. If open reduction of the fracture becomes necessary and several fragments are found (especially of the greater trochanter), they prefered to use a dynamic hip screw (DHS) with the trochanter stablizing plate.[12]

CONCLUSION

Our results suggest that the use of the proximal femoral nail may allow a faster post-operative restoration of walking ability, when compared with the dynamic hip screw.

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