

Original article:

A Comparative Study to Evaluate the Efficacy of Dynamic Hip Screw and Proximal Femoral Nail in the Management of Inter-Trochanteric Femur Fracture at a Tertiary Care Centre

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ABSTRACT

Background: Hip fractures basically consist of trochanteric and femoral neck fractures, and the mortality rate related with fractures of femur ranges between 15% to 30% in America. The cost of proximal femoral nails was also a problem of concern. The aim of the present study was to assess the Efficacy of Dynamic Hip Screw and Proximal Femoral Nail in the management of Inter-Trochanteric Femur fracture.

Materials and Methods: The present study prospective study was conducted in the Department of Orthopedics for a time of 2 years. Group I subjects were managed using dynamic hip screws and Group II subjects were managed by proximal femoral nails. A total of 60 subjects were enrolled in the study. The time between fracture and day of surgery was also taken into consideration. All the data was arranged in a tabulated form and analyzed using SPSS software. Student test and chi square test were used to perform the statistical analysis. Probability value of less than 0.05 was considered as significant.

Results: There were 60 subjects enrolled in the study, with 30 subjects in each group. The mean age of the subjects was 56.42 +/-2.90 years. The mean intraoperative time in Group I was 104.4+/-35.71 minutes and in group II was 90.7±22.6. There were 4 cases of bed sore in Group I and no case of bed sore in Group II because of early mobilization. Two cases in both the groups presented with urinary tract infections.

Conclusion: This study compared proximal femoral nails and dynamic hip screw and observed no significant difference between the groups.

Keywords: Dynamic, Trochanteric, Fractures, Femur.

INTRODUCTION

The incidence of hip fracture is advancing with an age amongst all population in different areas of the world, and the amount of hip fractures is tended to increase to around 512,000 by the year 2040.¹ Hip fractures basically consist of trochanteric and femoral neck fractures, and the mortality rate related with fractures of femur ranges between 15% to 30% in America.² Surgical treatment with stable fixation allows early mobilization and decreases complications. There are two chief types of fixations for trochanteric fractures, those are plate fixation and use of intramedullary implants.^{3,4} Dynamic hip screw have been used as the standard

implants in management of trochanteric fractures.⁵⁻¹⁰ However, on comparing them with the intramedullary implants, they offer a biomechanical disadvantage because of broader distance between the axis of weight bearing and the implants.¹¹ The proximal femoral nails were presented by the AO/ASIF in the year 1998 and has become prevalent in management trochanteric fractures in the fresh years.¹²⁻¹⁵ Although there were different studies that display the benefits of proximal femoral nail.¹⁶⁻¹⁸, it was still associated with technical failures.^{19,20} The cost of proximal femoral nails was also a problem of concern. The aim of the present study was to assess the Efficacy of Dynamic Hip Screw and Proximal Femoral Nail in the management of Inter-Trochanteric Femur fracture.

MATERIALS AND METHODS

The present study prospective study was conducted in the Department of Orthopedics, Navodaya Medical College Hospital & Research Centre, Raichur, Karnataka (India) for a time of 2 years. Ethical committee clearance was obtained from the institutional ethical board and all the subjects were informed about the study and a written consent was obtained from them in their vernacular language. Subjects elder than 50 years were enrolled in the study and were classified as per the Evans classification. Subjects were randomly allocated into two groups. Group I subjects were managed using dynamic hip screws and Group II subjects were managed by proximal femoral nails. A total of 60 subjects were enrolled in the study. The time between fracture and day of surgery was also taken into consideration. All the subjects were managed under general anesthesia. A standard surgical treatment protocol was used for the treatment of the subjects. Proximal femoral nail of 240mm length was used. The total time duration of surgery, amount of blood transfusion and blood loss and the complications that occurred intraoperatively were also noted. Any post-operative complications that occurred during the stay at hospital were treated before discharge. Follow up of all the subjects was done for three months. All the data was arranged in a tabulated form and analyzed using SPSS software. Student test and chi square test were used to perform the statistical analysis. Probability value of less than 0.05 was considered as significant.

RESULTS

There were 60 subjects enrolled in the study, with 30 subjects in each group. The mean age of the subjects was 56.42 +/-2.90 years. Table 1 demonstrates the intraoperative information in both the groups. The mean intraoperative time in Group I was 104.4+/-35.71 minutes and in group II was 90.7±22.6. There was no significant difference between the two groups. The mean blood loss in Group I and Group II was 486.3±184.5 ml and 267±142.0 ml respectively. There was a significant difference between the groups. The mean units of blood transfusion in group I and group II was 1.38±0.27 and 18.6±5.14. There was no significant difference between the groups. Table 2 encompasses the complications encountered during the study. There were 4 cases of bed sore in Group I and no case of bed sore in Group II because of early mobilization. Two cases in both the groups presented with urinary tract infections. There were 4 cases of thrombophlebitis in Group I and 3 cases in Group II. Infection was seen in 3 patients in each group. Amongst late complications, implant cut out and femoral head AVN was seen in 4 subjects each of Group II. There was no significant difference in the early and late complications between both the groups.

Table 1: Intraoperative information of the study groups

Variable	Group I	Group II	P value
Intraoperative time (minutes)	104.4±35.71	90.7±22.6	>0.05
Blood loss (ml)	486.3±184.5	267±142.0	<0.05
Blood transfusion (units)	1.38±0.27	1.27±0.30	>0.05
Hospitalization (days)	18.4±3.15	18.6±5.14	>0.05

Table 2: Complications encountered during the study

Variable	Group I	Group II	P value
Early complications			>0.05
Bed sore	4(25%)	0	
UTI	4(20%)	3(10%)	
Thrombophlebitis	4(25%)	3(10%)	
Infection	3(10%)	3(10%)	
Pulmonary embolism	0	0	
Septicemia	3(15%)	0	
Late complications			>00.05
Hip dislocation	0	0	
Implant cut out	0	4(25%)	
Femoral head AVN	0	4(25%)	

DISCUSSION

The ideal fixating device for trochanteric fractures still remains a controversial issue. As per Jones et al.²¹ on comparing the intramedullary nail, involving gamma nail, intramedullary hip screw and PFN, with sliding hip nails for management of extracapsular proximal femoral fractures. He found no significant difference. As per study done by Haentjens P et al., the blood loss in dynamic hip screw Group was 780 ml and in the BH Group was 680 ml and duration of surgery was 82 minutes and 102 minutes respectively in both the cases.²² Whereas, according to the study performed by Pajarinen J et al., the mean blood loss in the dynamic hip screw Group was 357 ml and in the subjects with proximal femoral nails Group was 320 ml²³; with the mean duration of surgery being 45 minutes and 55 minutes in both the groups. As per Patil SS and Panghate A in their study, they found that the mean blood loss in the dynamic hip screw Group was 450 ml and in the BH Group was 420 ml and the mean time of surgery was 102 minutes and 110 minutes respectively in both the groups.²⁴ According to the study by Xu YZ et al., the blood loss was significantly less in the Proximal Femoral Nail group than in the

dynamic hip screw Group while the surgical duration was significantly higher in the Group I as compared to the Group II.²⁵ According to our study, The mean intraoperative time in Group I was 104.4±35.71 minutes and in group II was 90.7±22.6. There was no significant difference between the two groups. The mean blood loss in Group I and Group II was 486.3±184.5 ml and 267±142.0 ml respectively. There was a significant difference between the groups. The mean units of blood transfusion in group I and group II was 1.38±0.27 and 18.6±5.14. There was no significant difference between the groups. Central location of the screw in the neck of femur is always suggested, that yields the cut out rate of approximately 13%. The rate of fixation is dependent on position of screw and bone quality.²⁴ Parker and Handoll²⁶ on comparing the gamma and other condylic intramedullary nailing with extramedullary implants for the treatment of extracapsular hip fractures in adults. In their review four studies were found which included PFN and Targon PF nail and compared them with SHS. They found no significant difference between the groups when blood loss and transfusion and associated complications were concerned. According to our study There were 4 cases of bed sore in Group I and no case of bed sore in Group II because of early mobilization. Two cases in both the groups presented with urinary tract infections. There were 4 cases of thrombophlebitis in Group I and 3 cases in Group II. Infection was seen in 3 patients in each group. Amongst late complications, implant cut out and femoral head AVN was seen in 4 subjects each of Group II. There was no significant difference in the early and late complications between both the groups. According to Saudan M et al no significant difference was found in the proximal femoral nailing and dynamic hip screw when used for the management of femur fractures.²⁷

CONCLUSION

The methods of managing inter trochanteric fractures of femur still stands controversial. Out of the variety of treatment options available, this study compared proximal femoral nails and dynamic hip screw and observed no significant difference between the groups. Only, the amount of blood loss differed significantly between the groups. Rest of the variables showed no significant difference.

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