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Original Article

Assessment of Efficacy of Dynamic Hip Screw and Proximal Femoral Nail in the Treatment of Inter-Trochanteric Fracture of Femur: A Comparative Study

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ABSTRACT

Background: The frequency of hip fracture has been increasing with an aging amongst population in different parts of the world, and the quantity of hip fractures is expected to influence around 512,000 in the year 2040. The proximal femoral nail presented by the AO/ASIF group in the year 1998 and has become prevalent in managing trochanteric fractures in the recent years. The present study was conducted to prospectively assess the Efficacy of Dynamic Hip Screw and Proximal Femoral Nail in the Treatment of Inter-Trochanteric Fracture of Femur. **Materials and methods:** The present study was conducted prospectively in the department of orthopedics for a duration of 1 year. A standard surgical procedure was used for the management of the subjects. Proximal femoral nail of 240mm was used. The total duration of surgery, amount of blood transfusion, amount of blood loss and the complications occurring intraoperatively were noted. 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 40 subjects enrolled in the study, with 20 subjects in each group. The mean age of the subjects was 55.43 +/-2.89 years. The mean intraoperative time in Group I was 103.9±34.72 minutes and in group II was 87.7±21.7. There was no significant difference between the two groups. There were 3 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:** Out of the varied options available, the present study compared proximal femoral nailing and dynamic hip screw and found that there was no significant difference between the groups. The amount of blood loss varied significantly between the groups rest all variables showed insignificant difference.

Keywords: Dynamic, Femoral Nail, Trochanteric

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INTRODUCTION

The frequency of hip fracture has been increasing with an aging amongst population in different parts of the world, and the quantity of hip fractures is expected to influence around 512,000 in the year 2040^[1]. Hip fractures basically include trochanteric and femoral neck fractures, and the mortality rate associated with former ranges between 15% to 30% in America^[2]. Surgical management with stable fixation enables early mobilization and decreases complications. There are basically two chief types of fixations for trochanteric fractures, it includes plate fixation and use of intramedullary implants^[3, 4]. Dynamic hip screw or sliding hip screw have been used as the standard implants in managing trochanteric fractures^[5-10]. However, when they are compared with the intramedullary implants, they offer a biomechanical disadvantage because of a broader distance between the axis of weight bearing and the

implants^[11]. The proximal femoral nail presented by the AO/ASIF group in the year 1998 and has become prevalent in managing trochanteric fractures in the recent years^[12-15]. Although there were various studies displaying benefits of proximal femoral nail^[16-18], it was still linked with technical failures^[19, 20]. The cost of proximal femoral nails was also an issue of concern. The present study was conducted to prospectively assess the Efficacy of Dynamic Hip Screw and Proximal Femoral Nail in the Treatment of Inter-Trochanteric Fracture of Femur.

Materials And Methods

The present study was conducted prospectively in the department of orthopedics for a duration of 1 year. The study was approved by the institutional ethical board and all the subjects were informed about the study. A written informed consent was obtained from all

the subjects in their vernacular language. All the subjects more than 50 years with unstable fractures were included in the study and classified according to Evans classification. Subjects were randomly divided into two groups. The first group was managed by dynamic hip screws and second group was managed by proximal femoral nails. A total of 40 subjects were recruited in the study. The duration between fracture and day of surgery was recorded. All the subjects were managed under general anesthesia. A standard surgical procedure was used for the management of the subjects. Proximal femoral nail of 240mm was used. The total duration of surgery, amount of blood transfusion, amount of blood loss and the complications occurring intraoperatively were noted. Any post-operative complications occurring during the hospital stay were managed before discharge. Patients were followed up 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.

RESULT

There were 40 subjects enrolled in the study, with 20 subjects in each group. The mean age of the subjects was 55.43 +/-2.89 years. Table 1 demonstrates the intraoperative information in both the groups. The mean intraoperative time in Group I was 103.9±34.72 minutes and in group II was 87.7±21.7. There was no significant difference between the two groups. The mean blood loss in Group I and Group II was 485.2±187.4 ml and 261±145.0 ml respectively. There was a significant difference between the groups. The mean units of blood transfusion in group I and group II was 1.37±0.37 and 1.25±0.28. There was no significant difference between the groups. Table 2 encompasses the complications encountered during the study. There were 3 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 3 cases of thrombophlebitis in Group I and 2 cases in Group II. Infection was seen in 2 patients in each group. Amongst late complications, implant cut out and femoral head AVN was seen in 3 subjects each of Group II. There was no significant difference in the early and late complications between both the groups.

DISCUSSION

The ideal fixation device for trochanteric fractures is still remains a controversial topic. According to Jones et al.^[21] they compared the intramedullary nail, involving gamma nail, intramedullary hip screw and PFN, with sliding hip nails for management of extracapsular proximal femoral fractures. They came to the conclusion that there was no statistically significant difference between the groups. According to a study done by Haentjens P et al., the mean blood loss in dynamic hip screw Group was 780 ml and in the BH Group was 680 ml and the duration of surgery was 82 minutes and 102 minutes respectively in both the groups.²² Whereas, as per the study done 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 time of surgery being 45 minutes and 55 minutes in both the groups. According to Patil SS and Panghate A in their study, they showed 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

Table 1: Intraoperative information of the study groups

Variable	Group I	Group II	P value
Intraoperative time (minutes)	103.9±34.72	87.7±21.7	>0.05
Blood loss (ml)	485.2±187.4	261±145.0	<0.05
Blood transfusion (units)	1.37±0.37	1.25±0.28	>0.05
Hospitalization (days)	18.5±3.14	18.62±5.14	>0.05

Table 2: complications encountered during the study

Variable	Group I	Group II	P value
Early complications			>0.05
Bed sore	3(15%)	0	
UTI	2(10%)	2(10%)	
Thrombophlebitis	3(15%)	2(10%)	
Infection	2(10%)	2(10%)	
Pulmonary embolism	0	0	
Septicemia	3(15%)	0	
Late complications			>00.05
Hip dislocation	0	0	
Implant cut out	0	3(15%)	
Femoral head AVN	0	3(15%)	

both the groups²⁴. As per the study by Xu YZ et al., the blood loss was significantly lesser 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 103.9±34.72 minutes and in group II was 87.7±21.7. There was no significant difference between the two groups. The mean blood loss in Group I and Group II was 485.2±187.4 ml and 261±145.0 ml respectively. There was a significant difference between the groups. The mean units of blood transfusion in group I and group II was 1.37±0.37 and 1.25±0.28. There was no significant difference between the groups. Central position of the screw in the femur neck is always recommended, that yields the cut out rate of approximately 13%. The forte of fixation is dependent on screw position and quality of bone.²⁴ Parker and Handoll²⁶ compared gamma and other condylic intramedullary nailing with extramedullary implants for the management of extracapsular hip fractures in adults. In their review four studies were enrolled which included PFN and Targon PF nail and compared them with SHS. They concluded that there was no significant difference between the groups with respect to blood loss and transfusion and associated complications. According to our study, there were 3 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 3 cases of thrombophlebitis in Group I and 2 cases in Group II. Infection was seen in 2 patients in each group. Amongst late complications, implant cut out and femoral head AVN was seen in

3 subjects each of Group II. There was no significant difference in the early and late complications between both the groups. As per Saudan M et al there was no significant difference in the proximal femoral nailing and dynamic hip screw.²⁷

CONCLUSION

Management of inter trochanteric femur fractures is controversial. Out of the varied options available, the present study compared proximal femoral nailing and dynamic hip screw and found that there was no significant difference between the groups. The amount of blood loss varied significantly between the groups rest all variables showed insignificant difference.

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