

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

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Abstract

Background: Dynamic hip screw has been regarded as the average implants in the management of fractures of trochanter. Even with various studies that indicate the advantages of proximal femoral nail, they were still associated with failures at technical level. The aim of the present study was to evaluate the Effectiveness of Dynamic Hip Screw and Proximal Femoral Nail in the management of Inter-Trochanteric Femur fracture. *Materials and Methods:* Patients were arbitrarily classified into two groups. Group I patients were managed with dynamic hip screws and Group II subjects were managed with proximal femoral nails. A total of 50 patients were enrolled in this study. Any post-operative complications occurring during the stay at hospital was managed before discharge. All the subjects were made to follow up for four months. Student test and chi square test were used for statistical analysis. Probability value of less than 0.05 was considered as significant. *Results:* The mean intraoperative time in Group I was 103.6±37.64 minutes and in group II was 93.8±23.5. There was no significant difference between the two groups. The mean blood loss in Group I and Group II was 485.3±176 ml and 275±141.0 ml respectively. There were 5 cases of bed sore in Group I and no case of bed sore in Group II because of early mobilization. *Conclusion:* When dynamic hip screw was compared with proximal femoral nails, the study found no characteristic difference in the groups.

Keywords: Dynamic; Trochanteric; Fractures; Femur.

Introduction

The chances of hip fracture are elevating with age in all population subgroups around different parts of the globe, and the frequency of hip fractures is predictable to increase to around 512,000 in 2040 [1]. Hip fractures crucially consist of trochanteric or femur neck fractures, and the mortality percentage associated with femoral fractures fluctuates between 15% to 30% in the United States of America [2]. With surgical treatment using fixation, rapid mobilization is likely and it also reduces the occurrence of complications. There are two different types of fixations for fractures of the trochanter, initially plate fixation and secondly

intramedullary implants [3,4]. Dynamic hip screw has been regarded as the average implants in the management of fractures of trochanter [5-10]. However, when compared with intramedullary implants, they ought to have a biomechanical drawback because of their broad length between the axis and the implants [11]. The proximal femoral nails were found by the AO/ASIF in the year 1998 and have become communal in the treatment of fractures of trochanter in the current years [12-15]. Even with various studies that indicate the advantages of proximal femoral nail [16-18], they were still associated with failures at technical level [19,20]. The cost of proximal femoral nails is also an issue. The aim of the present study was to

evaluate the Effectiveness of Dynamic Hip Screw and Proximal Femoral Nail in the management of Inter-Trochanteric Femur fracture.

Materials and Methods

The present prospective study was performed in the Department of Orthopedics, Government S K Hospital, Sikar, Rajasthan, India. Written consent was obtained from all the subjects. Patients elder than 50 years were enrolled in the study and were divided as per the Evans classification. Patients were arbitrarily classified into two groups. Group I patients were managed with dynamic hip screws and Group II subjects were managed with proximal femoral nails. A total of 50 patients were enrolled in this study. The time duration between fracture occurrence and time of surgery was recorded. All the patients were managed under general anesthesia. A typical surgical treatments strategy was used for operating the patients. Proximal femoral nail, 240 mm in length was used. The total time duration of surgery, amount of blood transfusion, blood loss and the complications encountered intraoperatively were also recorded. Any post-operative complications occurring during the stay at hospital was managed before discharge. All the subjects were made to follow up for four months. All the data thus obtained were recorded in a tabulated form and analyzed using SPSS software. Student test and chi square test were used for statistical analysis. Probability value of less than 0.05 was considered as significant.

Results

There were 50 subjects involved in the study, with 25 subjects in each category. The mean age of the subjects was 58.35 ± 4.65 years.

Table 1 demonstrates the intraoperative information in both the groups. The mean intraoperative time in Group I was 103.6 ± 37.64 minutes and in group II was 93.8 ± 23.5 . There was no significant difference between the two groups. The mean blood loss in Group I and Group II was 485.3 ± 176 ml and 275 ± 141.0 ml respectively. There was a significant difference between the groups. The mean units of blood transfusion in group I and group II was 1.28 ± 0.32 and 1.26 ± 0.24 . The mean hospitalization days in Group I was 19.2 ± 2.14 days and in Group II was 18.6 ± 5.28 . There was no significant difference between the groups. There was no significant difference in the mean hospitalization days between the groups.

Table 2 incorporates the complications found during the study. There were 5 cases of bed sore in Group I and no case of bed sore in Group II because of early mobilization. 6 cases Group I and 5 cases in Group II presented with urinary tract infections. There were 8 cases of thrombophlebitis in Group I and 5 cases in Group II. Infection was seen in 5 patients in each group. Amongst late complications, implant cut out and femoral head AVN was seen in 6 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)	103.6 ± 37.64	93.8 ± 23.5	>0.05
Blood loss (ml)	485.3 ± 176	275 ± 141.0	<0.05
Blood transfusion (units)	1.28 ± 0.32	1.26 ± 0.24	>0.05
Hospitalization (days)	19.2 ± 2.14	18.6 ± 5.28	>0.05

Table 2: Complications encountered during the study

Variable	Group I	Group II	p value
Early complications			>0.05
Bed sore	5(10%)	0	
UTI	6(12%)	5(10%)	
Thrombophlebitis	8(16%)	5(10%)	
Infection	5(10%)	5(10%)	
Pulmonary embolism	0	0	
Septicemia	5(10%)	5(10%)	
Late complications			>0.05
Hip dislocation	0	0	
Implant cut out	0	6(12%)	
Femoral head AVN	0	6(12%)	

Discussion

The ideal device for fixation of trochanteric fractures is still an issue of debate. As per Jones et al. [21]. when they compared the intramedullary nails, eg gamma nail, intramedullary hip screws and proximal femoral nails, with the sliding hip nails for the management of extracapsular proximal femoral fractures, no significant difference in the rate of complication and the surgical implications was observed. As per a study by Haentjens P et al., the mean blood loss in patients with dynamic hip screw was approximately 780 ml and in the BH Group was approximately 680 ml and the mean time duration of surgery was around 82 minutes and 102 minutes in each category [22]. On the contrary, according to the study performed by Pajarinen J et al., the blood loss amongst the subjects with dynamic hip screw was around 357 ml and in the patients with

proximal femoral nail was around 320 ml [23]; and the mean surgical duration was approximately 45 minutes and 55 minutes in both the categories respectively. A study by Patil SS and Panghate A, the mean blood loss in Group with dynamic hip screw was around 450 ml and in the BH Group was approximately 420 ml and the mean duration of surgery was 102 minutes and 110 minutes in the groups respectively [24]. As per Xu YZ et al., the blood loss was significantly slighter in the subjects with Proximal Femoral Nail than in the subjects with dynamic hip screw and the duration of surgery was significantly greater in the Group I than Group II [25]. According to our study, The mean intraoperative time in Group I was 103.6 ± 37.64 minutes and in group II was 93.8 ± 23.5 . There was no significant difference between the two groups. The mean blood loss in Group I and Group II was 485.3 ± 176 ml and 275 ± 141.0 ml respectively. There was a significant difference between the groups. The mean units of blood transfusion in group I and group II was 1.28 ± 0.32 and 1.26 ± 0.24 . The mean hospitalization days in Group I was 19.2 ± 2.14 days and in Group II was 18.6 ± 5.28 . There was no significant difference between the groups. There was no significant difference in the mean hospitalization days between the groups. Central location of the screw in femoral necks mostly dictated, as that allows the cut out rate of approximately 13%. The rate of fixation is contingent on location of screw and the superiority of bone [24]. As according to the study by Parker and Handoll [26] on comparing the gamma and other condylar intramedullary nails with extramedullary implants for managing extracapsular hip fractures, they found four studies that enrolled PFN and Targon Proximal femoral nail and compared all with SHS. They did not find any significant difference between the categories when blood loss and transfusion and related complications were compared. As per the present study, there were 5 cases of bed sore in Group I and no case of bed sore in Group II because of early mobilization. 6 cases Group I and 5 cases in Group II presented with urinary tract infections. There were 8 cases of thrombophlebitis in Group I and 5 cases in Group II. Infection was seen in 5 patients in each group. Amongst late complications, implant cut out and femoral head AVN was seen in 6 subjects each of Group II. There was no significant difference in the early and late complications between both the groups. According to a study performed by Saudan M et al. no significant change was observed in complication rate related with treatment of femoral fractures with proximal femoral nails and dynamic hip screw [27].

Conclusion

The treatment of fractures of the intertrochanteric region remains a controversial management protocol. There are various management options present for management of femur fractures. When dynamic hip screw was compared with proximal femoral nails, the study found no characteristic difference in the groups. The amount of blood loss demonstrated a significant difference in the groups.

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