

Analysis of Dynamic Hip Screw (DHS) Fixation in Treatment of Intertrochanteric Fractures: An Observational Study

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ABSTRACT

Background: Although many devices can achieve rigid fixation, the dynamic hip screw (DHS) is the most commonly used device for intertrochanteric fractures. Hence; under the light of above mentioned data, the present study was undertaken for assessing the efficacy of DHS fixation in treatment of intertrochanteric fractures.

Materials & Methods: Analysis of a total of 25 patients who reported to the Department of Orthopaedics, Dr. Ulhas Patil Medical College & Hospital, Jalgaon Khurd, Jalgaon, Maharashtra (India) with inter-trochanteric femur fractures was included. Detailed demographic profile and clinical details of all the patients was recorded in Microsoft excel sheet. All the surgical procedures were commenced under the hands of skilled and experienced orthopedic surgeons. Harris hip score (HHS) was used for assessment of postoperative treatment outcome. Calculation of HHS was done preoperatively and postoperatively. Follow-up records were maintained in all the patients for assessing the outcome of DHS. All the results were analyzed by SPSS software.

Results: Mean HHS at preoperative time was 49.2. Mean HHS at one month postoperatively, 2 months postoperatively, 3 months postoperatively and 6 months postoperatively was

found to be 57.1, 64.8, 75.9 and 83.8 respectively. A significant improvement in the mean HHS was seen postoperatively at different time intervals. Postoperatively complications were seen was found to be present in 3 patients.

Conclusion: For treating patients with stable intertrochanteric hip fractures, Dynamic hip screw is an effective option.


Keywords: Dynamic Hip Screw, Hip Fracture.

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INTRODUCTION

Surgical management of displaced subcapital fractures of the femoral neck continues to be challenging. Internal fixation, hemiarthroplasty, and total hip replacement could be considered as appropriate solutions. Closed methods of treating intertrochanteric fractures have been abandoned. Rigid fixation with early mobilisation of patients should be considered as the standard treatment. Although many devices can achieve rigid fixation, the dynamic hip screw (DHS) is the most commonly used device for intertrochanteric fractures.¹⁻³

There are few published reports focusing on DHS in the treatment of femoral intracapsular displaced neck fractures. Parker and Blundell⁴ analysed the use of these implants for internal fixation. They reviewed 25 randomized trials and concluded that most studies have had an insufficient number of subjects to permit a valid comparison. Chen et al,⁵ using DHS in extracapsular basicervical neck fractures, achieved union in 97.5% of their patients, with no cases of avascular necrosis and 1.7% of nonunion. Osteosynthesis not only has the potential to offer

normal hip function after fracture consolidation but also has a relatively high rate of failure and complications in the form of nonunion, avascular necrosis, redisplacement, and so forth. Hence; under the light of above mentioned data, the present study was undertaken for assessing the efficacy of DHS fixation in treatment of intertrochanteric fractures.

MATERIALS AND METHODS

The present study was conducted in the Department of Orthopaedics, Dr. Ulhas Patil Medical College & Hospital, Jalgaon Khurd, Jalgaon, Maharashtra (India) and it included assessment of effectiveness and outcome of DHS fixation in patients with intertrochanteric fractures. For the present study, ethical approval was obtained from the ethical committee of the institution. Also, consent was obtained from all the patients after explaining in detail the entire research protocol. Analysis of a total of 25 patients who reported to the department of orthopedics with intertrochanteric femur fractures was included. Detailed demographic

profile and clinical details of all the patients was recorded in Microsoft excel sheet. All the surgical procedures were commenced under the hands of skilled and experienced orthopedic surgeons. Harris hip score (HHS) was used for assessment of postoperative treatment outcome. Calculation of HHS was done preoperatively and postoperatively. Follow-up

records were maintained in all the patients for assessing the outcome of DHS.

All the results were analyzed by SPSS software. One-way chi-square test and Mann Whitney U test were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

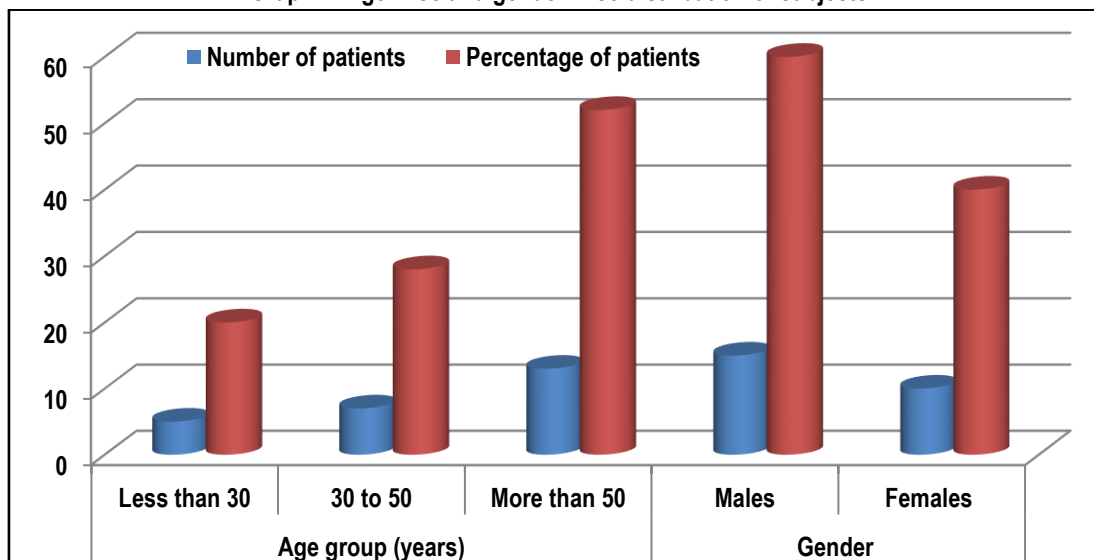
Table 1: Complications among patients of DHS group

Type of Complication	No. of patients	Percentage
Skin puckering with superficial infection	2	8
Cut-out	1	4
None	22	88
Total	25	100

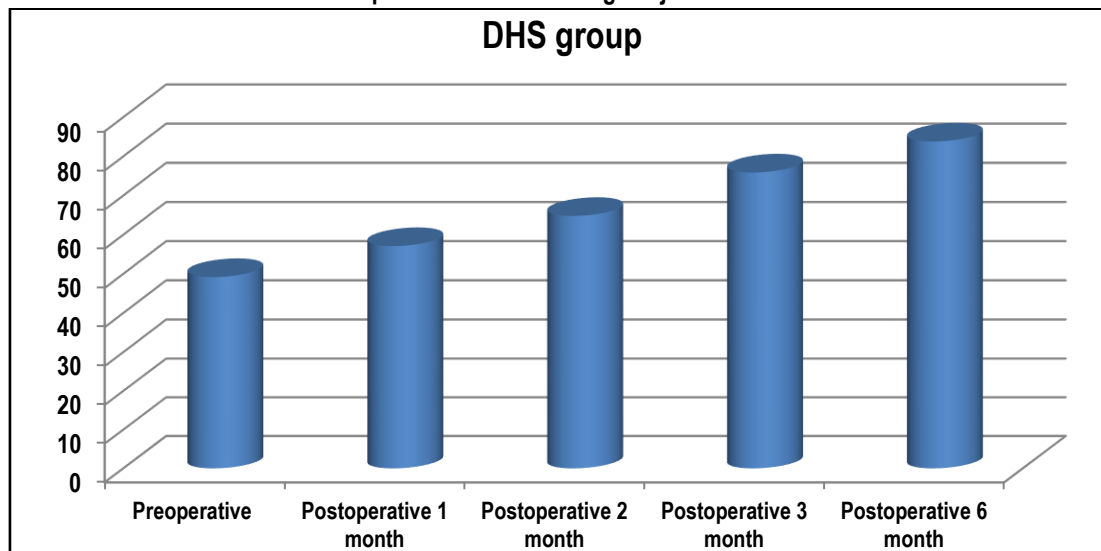
Table 2: Mean HHS among subjects of DHS

HHS Score	DHS group	P- value
Preoperative	49.2	0.01
Postoperative 1 month	57.1	(Significant)
Postoperative 2 month	64.8	
Postoperative 3 month	75.9	
Postoperative 6 month	83.8	

Graph 1: Age-wise and gender-wise distribution of subjects



Graph 2: Mean HHS among subjects of DHS



RESULTS

In the present study, a total of 25 patients with intertrochanteric fractures were enrolled in the present study. Mean age of the patients of the present study was 63.8 years. Majority of the patients (52 percent) belonged to the age group of more than 50 years. 60 percent of the patients of the present study were males while remaining 40 percent were females. Mean HHS at preoperative time was 49.2. Mean HHS at one month postoperatively, 2 months postoperatively, 3 months postoperatively and 6 months postoperatively was found to be 57.1, 64.8, 75.9 and 83.8 respectively. A significant improvement in the mean HHS was seen postoperatively at different time intervals. Postoperatively complications were seen was found to be present in 3 patients. Out of these 3 patients, 2 has skin puckering with superficial infection while Cut-out was seen in 1 patient.

DISCUSSION

The incidence of intertrochanteric fractures has been increasing significantly due to the rising age of modern human populations. Generally, intramedullary fixation and extramedullary fixation are the 2 primary options for treatment of such fractures. For internal fixation, most orthopaedic surgeons choose either a dynamic hip screw (DHS) or multiple cannulated screws (MCS). Osteosynthesis with MCS fixation is a less invasive technique and reduces blood loss and soft tissue stripping. With the use of DHS the screw-plate system achieves a more stable condition. In a previous published study, a biomechanical comparison of internal fixation techniques for the treatment of unstable basicervical femoral neck fractures was done. The results support the use of DHS. Its disadvantages are large skin incisions, more extensive soft tissue dissection, a greater need for blood transfusion, and a longer stay in hospital.⁵⁻⁸

In the present study, a total of 25 patients with intertrochanteric fractures were enrolled in the present study. Mean age of the patients of the present study was 63.8 years. Majority of the patients (52 percent) belonged to the age group of more than 50 years. 60 percent of the patients of the present study were males while remaining 40 percent were females. Zhao W et al⁹ discussed the indications, surgical procedures, and curative effect of dynamic hip screw (DHS) in the treatment of femoral neck fracture in the elderly. A retrospective study was conducted to analyse the clinical data of 42 elderly patients who had been treated for femoral neck fracture with DHS. There were 21 males and 21 females with a mean age of 68.5 years (range 60-75 years). According to the Garden Classification, there were 19 cases of type II, 21 cases of type III and 2 cases of type IV fractures. By the Singh Index Classification, there were 3 cases of level 2, 19 cases of level 3 and 20 cases of level 4 fractures. The average hospitalization time in 42 patients was 11.2 days (range 7-21 days). All patients were followed up for 12-26 months (mean 18 months). No lung infection, deep venous thrombosis or other complications occurred. Partial backing-out of the screws was found in 2 cases. The internal fixation device was withdrawn after fracture healing. Internal fixation cutting was found in 1 case, and he had a good recovery after total hip arthroplasty. The time for fracture healing ranged from 3-6 months (average 4.5 months). According to Harris criterion, 15 cases were rated as excellent, 24 good, 2 fair and 1 poor. The Harris scale was significantly

improved from 30.52 ± 2.71 preoperatively to 86.61 ± 2.53 at 6 months postoperatively ($P < 0.05$). DHS, being minimal invasive, allowing early activity and weight-bearing, is advisable for treatment of elderly patients with femoral neck fracture. In addition, it can avoid complications seen in artificial joint replacement.

In the present study, Mean HHS at preoperative time was 49.2. Mean HHS at one month postoperatively, 2 months postoperatively, 3 months postoperatively and 6 months postoperatively was found to be 57.1, 64.8, 75.9 and 83.8 respectively. A significant improvement in the mean HHS was seen postoperatively at different time intervals. Postoperatively complications were seen was found to be present in 3 patients. Out of these 3 patients, 2 has skin puckering with superficial infection while Cut-out was seen in 1 patient. Schwartzmann CR et al¹⁰ assessed the correlation between avascular necrosis and the demographics, time elapsed from fracture to surgery, quality of reduction, Garden classification, and the position of the screw following use of the dynamic hip screw (DHS) in the treatment of subcapital neck fractures. A prospective study of 96 patients with subcapital neck fractures was carried out. Patients underwent surgery with closed reduction and internal fixation with DHS. There were 58% male and 42% female patients, with a mean age of 53 years (± 14). In terms of Garden classification, 60% were Garden IV, 26% were Garden III, and 14% were Garden II. Nonunion was observed in three cases (3%) and was treated with valgus intertrochanteric osteotomy, in all cases leading to successful healing. Avascular necrosis was observed in 16% of patients. The positioning of the screw into the femoral head showed a significant correlation with necrosis. The incidence of necrosis in patients under the age of 50 years is twice as high as that in older patients. Displacement is a predictive factor regarding osteonecrosis and is associated with a high and anterior position of the screw in the femoral head. Level II of evidence.

CONCLUSION

From the above results, it can be concluded that for treating patients with stable intertrochanteric hip fractures, Dynamic hip screw is an effective option. However; further studies are recommended.

REFERENCES

1. Rupprecht M, Grossterlinden L, Ruecker AH, et al. A comparative biomechanical analysis of fixation devices for unstable femoral neck fractures: The intertan versus cannulated screws or a dynamic hip screw. *J Trauma*. 2011;71:625-34.
2. Huang Y, Zhang C, Luo Y. A comparative biomechanical study of proximal femoral nail (intertan) and proximal femoral nail antirotation for intertrochanteric fractures. *Int Orthop*. 2013;37:2465-73.
3. Bhakat U, Bandyopadhyay R. Comparative Study between Proximal Femoral Nailing and Dynamic Hip Screw in Intertrochanteric Fracture of Femur. *Open Journal of Orthopedics*, 2013, 3, 291-295.
4. Parker MJ, Blundell C. Choice of implant for internal fixation of femoral neck fractures. Meta-analysis of 25 randomised trials including 4925 patients. *Acta Orthopaedica Scandinavica*. 1998;69(2):138-143.

5. Chen W-C, Yu S-W et al. Treatment of undisplaced femoral neck fractures in elderly. *Journal of trauma*. 2005;58(5):1035–39.
6. Kumar R, Singh RN, Singh BN. Comparative prospective study of proximal femoral nail and dynamic hip screw in treatment of intertrochanteric fracture femur. *Journal of Clinical Orthopaedics and Trauma*. 2012;3(1):28-36.
7. Mardani-Kivi M, Mirbolook A, Khajeh Jahromi S, Rouhi Rad M. Fixation of Intertrochanteric Fractures: Dynamic Hip Screw versus Locking Compression Plate. *Trauma Mon*. 2013;18(2):67–70.
8. Yong C, Tan C, Penafort R. Dynamic hip screw compared to condylar blade plate in the treatment of unstable fragility intertrochanteric fractures. *Malays orthop J*. 2009;3:13–8.
9. Zhao W, Liu L, Zhang H, Fang Y, Pei F, Yang T. Effect of dynamic hip screw on the treatment of femoral neck fracture in the elderly. *Chin J Traumatol*. 2014 Apr 1;17(2):69-72.
10. Schwartzmann CR, Jacobus LS et al. Dynamic hip screw for the treatment of femoral neck fractures: a prospective study with 96 patients. *ISRN Orthop*. 2014;2014:257871.

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