International Journal of Orthopaedics Sciences

ISSN: 2395-1958
IJOS 2017; 3(2): 907-910

www.orthopaper.com
Received: 11-02-2017
Accepted: 12-03-2017

Dr. Parijat Gupta
Professor, Department of Orthopaedics, Government Medical College, Kannauj, Uttar Pradesh, India

Correspondence
Dr. Parijat Gupta
Professor, Department of Orthopaedics, Government Medical College, Kannauj, Uttar Pradesh, India

Assessment of patients undergoing treatment for inter-trochanteric fractures of femur: A comparative study

Dr. Parijat Gupta

DOI: https://doi.org/10.22271/ortho.2017.v3.i2j.101

Abstract
Background: The incidence of intertrochanteric fractures is gender and race dependent and varies from country to country. Dynamic hip screw (DHS) is the most commonly used implant and is considered gold standard. Current preferred treatment shows an inclination towards use of proximal femoral nail (PFN) and gamma nail. Hence; we planned the present study to assess and compare the outcome of intertrochanteric fractures patients treated with DHS and PFN.
Materials & methods: The present prospective study included assessment of 20 patients. All the patients were broadly divided into two study groups with 10 patients in each group. Group 1: Closed reduction and fixation with proximal femoral nail (PFN), and Group 2: Closed reduction and fixation with dynamic hip screw (DHS).A detailed history, preoperative and postoperative clinico-radiological examination was carried out in all 20 cases. Complete hematological and radiographic examination was done in all the patients. Treatment of patients of both the study groups was done depending upon the type of treatment protocol followed. Patients were re-called for follow up after every three weeks till union occurs and then were assessed according to Harris Hip score. All the results were analyzed by SPSS software.
Results: There were 13 (65%) males and 7 (35%) females in the study population. We observed non-significant difference while comparing the harris hip score in patients of both the study groups.
Conclusion: No significant difference occurred between the two modalities in terms of long term mobility and fracture union.

Keywords: Dynamic hip screw, Fracture, Proximal femoral nail

Introduction
Proximal femoral fractures are one of the commonest fracture in geriatric population and their incidence is predicted to grow rapidly with increase in aging population. The incidence of intertrochanteric fractures is gender and race dependent and varies from country to country [1, 2]. The standard of care today is operative reduction and internal fixation and early rehabilitation. Despite the general success of dynamic hip screw for stabilization of intertrochanteric fractures, dissatisfaction with the resultant deformity associated with the use of this type of device to stabilize unstable fracture patterns. Excessive sliding of the lag screw results in limb shortening and medialization of the femoral shaft [7] and high chances of implant failure [3-5]. Dynamic hip screw (DHS) is the most commonly used implant and is considered gold standard. Current preferred treatment shows an inclination towards use of proximal femoral nail (PFN) and gamma nail [6-8]. This is challenging the gold standard treatment of DHS which has a universal validity in global population samples. It is said to be better in terms of both short term and long term results as well in unstable fractures [9].
Hence; we planned the present study to assess and compare the outcome of intertrochanteric fractures patients treated with DHS and PFN.

Materials & Methods
The present prospective study was done in the department of Orthopedics and included assessment of 20 patients. All the patients were broadly divided into two study groups with 10 patients in each group.
Group 1: Closed reduction and fixation with proximal femoral nail (PFN), and
Group 2: Closed reduction and fixation with dynamic hip screw (DHS)

Methodology

The cases for this study have been taken from the patients attending the orthopedic emergency. X-ray pelvis with bilateral hip - Anteroposterior view was taken to diagnose the fracture. A detailed history, preoperative and postoperative clinico-radiological examination was carried out in all 20 cases. Careful skin traction was applied until the patient was fit for surgery. Preanesthetic clearance was obtained and all the cases were operated within 15 days of sustaining the trauma. Various clinical parameters were assessed for evaluating the clinical profile of all the subjects. Complete hematological and radiographic examination was done in all the patients.

Group A - Fixation with Proximal femoral nail (PFN)

Under spinal anaesthesia patient was put on spica table closed reduction was checked under C-arm in AP view by seeing the alignment of medial cortex and in lateral view the posterior cortex, then under all aseptic conditions after proper painting and draping through longitudinal skin incision 2-3 cm proximal to greater trochanter tip. Skin subcutaneous tissue cut, deep fascia cut, then with the help of bone owl, entry made over greater trochanter tip lateral to the piriformis fossa, then guidewire inserted and passed across fracture side and sequential reaming will be done, then appropriate size PFN will be inserted and passed over fracture side, then proximal locking done with the help of zig and then distal locking done with the help of C-arm. Wound washed with normal saline and betadine. Wound stitched in layers. Dressing then done and crepe applied.

Group B - Fixation with Dynamic hip screw (DHS)

Under spinal anaesthesia patient was put on spica table closed reduction done and checked under C-arm in AP view by seeing the alignment of medial cortex and in lateral view the posterior cortex. Then under all aseptic conditions after proper painting and draping through lateral skin incision just below greater trochanter. Skin subcutaneous tissues cut, deep fascia cut, then vastuslateralis incised from its origin and reflected anteromedially with the help of bone livers, then by using an angle guide (135º) bone entery made with the help of drill below trochanteric flare, then guide wire was inserted and its position central and parallel to the neck checked under C-arm in both AP and lateral view. Guidewire passed upto 5 mm short of subchondral bone. After reaming with triple reaming on the guide wire, appropriate size lag screws inserted, then 135º angle barrel plate of appropriate length was applied and fixed with screws atleast 8 cortices. Guidewire removed and compression screw applied, wound washed with normal saline and betadine, wound stitched in layers over negative drain, aspectic dressing then done and crepe applied.

Drain was removed after 48 hours, stitches were removed after 10 days, patient with PFN were allowed to walk with partial weight bearing after removal of drain, and in DHS cases after three weeks.

Patients were then called for follow up after every three weeks till union occurs and then were assessed according to Harris Hip score. All the post-operative values of heamatological and radiographic parameters was recorded and assessed. All the results were analyzed by SPSS software. Chi- square 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 20 patients were included in the present study. There were 13 (65%) males and 7(35%) females in the study population (Table 1). In 55 percent of the patients, the etiology of the trauma was fall while in remaining 45 percent of the cases; the etiology was road side accident (Table 2). We observed non- significant difference while comparing the harris hip score in patients of both the study groups (Table 3). This study showed good post-operative function as per Harris Hip Score.

Table 1: Showing sex wise distribution.

Sex	DHS		PFN		Total	
	No.	%age	No.	%age	No.	%age
Male	6	60	7	70	13	65
Female	4	40	3	30	7	35
Total	10	100%	10	100%	20	100%

Table 2: Showing mode of trauma.

Mode of trauma	DHS		PFN		Total	
	No.	%age	No.	%age	No.	%age
Fall	6	60	5	50	11	55
Road Side Accident	4	40	5	50	9	45
Total	10	100.00	10	100.00	20	100.00

Table 3: Showing harris hip score.

Follow-up (weeks)	DHS	PFN	p-value*
Pain	37.6	37.4	0.25
Function	37.2	39	0.40
Absence of deformity	4	4	-
Range of motion	4	4	-
Total score	82.8	84.5	0.36

Discussion

Trochanteric fracture of femur have always been recognized as a major challenge by the orthopedics community not only for achieving fracture union, but also for restoration of optimal function in the shortest possible time and with minimal complications [10].

A Dynamic Hip Screw is the most commonly used implant for intertrochanteric fractures. However, because the load bearing in the proximal femur is predominantly through calcarfemorale, the lever arm of laterally placed plate is increased so there is a risk of implant cut out [11- 13]. Hence; we planned the present study to assess and compare the outcome of intertrochanteric fractures patients treated with DHS and PFN.

Non-statistically significantwas observed while comparing the harris hip score in patients of both the study groups. This study showed good post operative hip function in both PFN and DHS groups according to Harris Hip Score.

A study from the past literature reported results in 123 patients of intertrochanteric fractures treated with gamma nail. The Gamma nail transmits weight closer to the calcar than does the dynamic hip screw and it has greater mechanical strength. A semi-closed operative technique is used, with an average duration of operation of 35 minutes and little blood loss. Distal locking screws can be used to maintain rotational stabifity, and can be inserted without the use of an image intensifier. Results showed satisfactory fracture union with little loss of position, even in comminuted fractures. Operative complications were few, but included fractures of the base of the greater trochanter. The most important postoperative complication, seen in one case, was fracture of

the shaft of the femur at the distal end of the nail, but this healed well after re-nailing [11].

A prospective study comparing the outcome of proximal femoral nail (PFN) and dynamic hip screw (DHS) fixation of 70unstable intertrochantaric fractures concluded that proximal femoral nail (PFN) may be used successfully in the fixation of unstable fractures with similar results to the dynamic hip screw (DHS) for mobility at 6 months. Proximal femoral nail (PFN) was associated with reduced blood loss, shorter hospital stay and less morbidity compared with dynamic hip screw (DHS) [12].

In a comparative study of unstable per- and intertrochanteric fractures, it was concluded that Proximal femoral nail (PFN) was associated with shorter operation time (43 vs. 61 min) and a considerable shorter in-patient stay (20 vs 24 days). Full-weight-bearing immediately after the osteosynthesis was possible for 98% of the proximal femoral nail (PFN) patients and 81% of the dynamic hip screw (DHS) patients. The DHS osteosynthesis in unstable trochanteric fractures is associated with a higher incidence of complications [13].

A randomized prospective study of one hundred and eight patients of pertrochanteric fractures treated either with a dynamic hip screw (DHS) or a proximal femoral nail (PFN) to compare post-operative rehabilitation and concluded that proximal femoral nail (PFN) allowed a faster postoperative restoration of walking ability compared with dynamic hip screw (DHS) [14].

A study in 2002 reviewed 155 consecutive patients who were treated with a proximal femoral nail from 1997 to 2001 to determine the rate of implant specific complications. Failure of fixation occurred in three patients (2%), and a femoral shaft fracture occurred in one patient (0.7%). Fixation failures included one cutout, one delayed fracture healing, and one lateral displacement of the antirotation screw. The total reoperation rate was high (12%) mainly because of hardware removals, which occurred in 13 patients (8.6%). Because the high reoperation rate with the proximal femoral nail is a concern, extramedullary devices continue to be the preferred implants for treatment of stable trochanteric fractures. The low rates of femoral shaft fractures and failure of fixation suggest the proximal femoral nail is useful for treatment of unstable trochanteric and subtrochanteric fractures [15].

A study compared the results of a new intramedullary Gamma nail and a compression hip screw in the treatment of trochanteric fractures in a prospective randomized study in 210 patients. The results show no difference in operating time, but the Trochanteric Gamma nail group had a significantly shorter fluoroscopy time, and the number of patients transfused and the mean of units of blood transfused were significantly less in the Trochanteric Gamma nail group. There was no difference in intraoperative and postoperative complications or rate of fixation failure between the 2 groups, and no case of secondary shaft fracture of the femur was encountered in this study. There was no difference in the functional outcome but the postoperative walking ability was better in those patients with unstable fractures who were treated with the Trochanteric Gamma nail. They concluded that the new Trochanteric Gamma nail is an effective method for the treatment of trochanteric femoral fractures in elderly patients. The indication for either Trochanteric Gamma nail or compression hip screw are similar in stable fractures, but recommend the use of the Trochanteric Gamma nail for unstable trochanteric fractures [16].

Conclusion

From the above results, the authors concluded that there is no difference between the two modalities in terms of long term mobility and fracture union. However, future studies are recommended.

References

1. Baumgaertner MR, Oetgen ME. Intertrochanteric hip fractures. In: Browner BD, Jupiter JB, Levine AM, Trafton PG, editors. Skeletal Trauma, 4th ed. Philadelphia: Saunders Elsevier, 2009, 1913-56.
2. Jacobs RR, McClain O, Armstrong HJ. Internal fixation of intertrocchanteric hip fractures: A clinical and biomechanical study. Clin Orthop. 1980; 146:62-70.
3. Rha JD, Kim YH, Yoon SI. Factors affecting sliding of the lag screw in intertrochanteric fractures. Int Orthop, 1993; 17(5):320-4.
4. Kim WY, Han CH, Park JI. Failure of intertrochanteric fracture fixation with a dynamic hip screw in relation to pre-operative fracture stability and osteoporosis. Int Orthop. 2001; 25(6):360-2.
5. Lavelle DG. Fractures and dislocation of hip. In: Canale ST, Beaty JH, editors. Campbell's Operative Orthopaedics, 11th ed. Philadelphia: Mosby Elsevier, 2008, 3237-70.
6. Hoffmann R, Haas NP. Femur, proximal. In: Ruedi TP, Buckley RE, Moran CG, editors. AO Principles of Fracture Management. 2 nd expanded ed. New York: Thieme, 2007, 751-66.
7. Bridle SH, Patel AD, Bircher M, Calvert PT. Fixation of intertrochanteric fractures of the femur: a randomized prospective comparison of the gamma nail and the dynamic hip screw. JBJS (Br). 1991; 73-B:330-4.
8. Leung KS, So WS, Shen WY, Hui PW. Gamma nails and dynamic hip screws for peritrochanteric fractures: a randomized prospective study in elderly patients. JBJS (Br). 1992; 74-B:345-51.
9. Halder SC. Gamma nail for peritrochanteric fractures. JBJS (Br) 1992; 74-B:340-4.
10. Radford PJ, Needoff M, Webb JK. A prospective randomized comparison of the dynamic hip screw and the gamma locking nail. JBJS (Br). 1993; 75-B:789-93.
11. O'Brien PJ, Meek RN, Blachut PA, Broekhuyse HM, Sabharwal S. Fixation of intertrochanteric hip fractures: gamma nail versus dynamic hip screw: A randomized, prospective study. Can J Surg. 1995: 38(6):516-20.
12. Werner-Tutschku W, Lajtai G, Schmiedhuber G, Pirkl C, Orthner E. Intra- and perioperative complications in the stabilization of per- and subtrochanteric femoral fractures by means of PFN. Unfallchirurg, 2002; 105:881-5.
13. Boldin C, Seibert FJ, Fankhauser F, Peicha G, Grechenig W, Szyszkowitz R. The proximal femoral nail (PFN) - a minimal invasive treatment of unstable proximal femoral fractures: A prospective study of 55 patients with a follow-up of 15 months. Acta Orthop Scand. 2003; 74(1):53-8.
14. Rebuzzi E, Pannone A, Schiavetti S, Santoriello P, de Nicola U, Fancellu G *et al*. IMHS clinical experience in the treatment of peritrochanteric fractures. The results of a multicentric Italian study of 981 cases. Injury. 2002; 33(5):407-12.
15. Nuber S, Schonweiss T, Ruter A. Stabilisation of unstable trochanteric femoral fractures: Dynamic hip screw (DHS) with trochanteric stabilization plate vs proximal femur nail (PFN). Unfallchirurg, 2003:

106(1):39-47.
16. Klinger HM, Baums MH, Eckert M, Neugebauer R. A comparative study of unstable per- and intertrochanteric femoral fractures treated with dynamic hip screw (DHS) and trochanteric butt-press plate vs. proximal femoral nail (PFN). Zentralbl Chir. 2005; 38:401-5.