

## FUNCTIONAL OUTCOME OF INTERTROCHANTERIC FRACTURES AFTER FIXATION WITH PFN OR DHS IN ELDERLY- A COMPARATIVE STUDY

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### ABSTRACT

#### BACKGROUND

Ninety percent of the hip fractures in the elderly result from a simple fall. More than fifty percent of the hip fractures in the elderly are intertrochanteric fractures. The goal of treatment of any intertrochanteric fracture in elderly is to restore mobility at the earliest and minimise the complications of prolonged bed rest. The Dynamic Hip Screw (DHS) has been shown to produce good results, but complications are frequent, particularly in unstable intertrochanteric fractures. Intramedullary fixation is considered to provide a more biomechanically stable construct by reducing the distance between the hip joint and implant.

#### MATERIALS AND METHODS

The goal of this study is to compare the functional outcome of intertrochanteric fractures in elderly patients treated with Proximal Femoral Nail (PFN) and Dynamic Hip Screw (DHS) by analysing the clinical and radiological results to evaluate the advantages and disadvantages and possible complications associated with fixation of intertrochanteric fractures with PFN and DHS.<sup>1</sup> In our study, we included 106 intertrochanteric fractures, out of which 46 were treated with PFN and 60 with DHS. Ordinary fracture table was used in all cases and were followed up at regular intervals of 4, 8 and 12 weeks, 6 months and one year.

#### RESULTS

Functional results were assessed with modified Harris hip score. We observed significantly higher excellent results and less poor results in PFN compared to DHS.

#### CONCLUSION

Unstable intertrochanteric fractures treated with PFN have significantly better outcome than DHS. In unstable fractures, reduction loss, union in varus and limb shortening are significantly higher in DHS. Hence, the advantages of PFN are less surgical trauma, less blood loss and the possibility of early weightbearing even after very complex fractures.

#### KEYWORDS

Trochanteric Fracture, PFN, DHS, Elderly.

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#### BACKGROUND

Ninety percent of the hip fractures in elderly result from a simple fall. Elderly people are prone to these fractures mostly because of reduced bone density, visual impairment, malnutrition, neurological impairment, reduced physical activity, reduced muscle power and reduced protective reflexes.<sup>2</sup>

Intertrochanteric fractures account for approximately half of the hip fractures in elderly.<sup>3</sup> Operative treatment has become the treatment of choice for intertrochanteric fractures and consists of fracture reduction and stabilisation,

because it permits early mobilisation and minimises many of the complications of prolonged bed rest.

The DHS has gained widespread acceptance in the last decade and is currently considered as the standard device for comparison of outcome.<sup>4</sup> The DHS has been shown to produce good results, but complications are frequent, especially in unstable intertrochanteric fractures. Intramedullary fixation is considered to provide a more biomechanically stable construct by reducing the distance between the hip joint and the implant. The goal of this study is to compare<sup>1</sup> the functional outcome of intertrochanteric fractures in elderly patients treated with PFN and DHS by analysing the clinical and radiological results<sup>5</sup> to evaluate the advantages and disadvantages and possible complications associated with fixation of intertrochanteric fractures with PFN and DHS.

#### MATERIALS AND METHODS

106 intertrochanteric fractures, which were surgically treated with PFN and DHS, between January 2014 and December 2016 in our institution. 46 patients treated with

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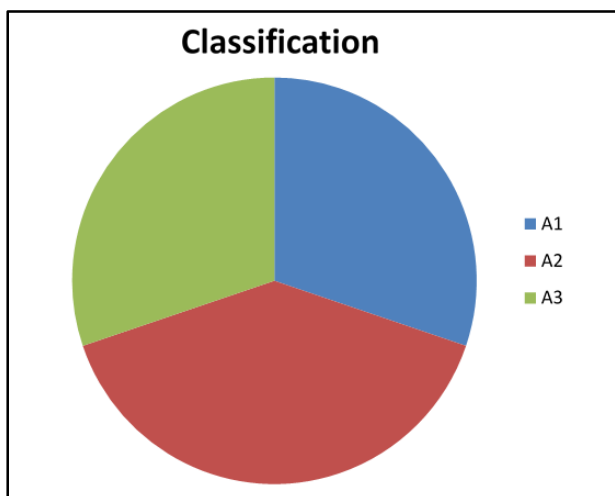
PFN were included in Group A and 60 patients treated with DHS in Group B. Patients were operated on standard fracture table under image intensifier control.

Study Groups	Sex		Average Age	Age Range	Fracture Type 31 A		
	M	F			A1	A2	A3
A PFN	21	25	74.6	61-89	6	18	22
B DHS	22	38	72.4	60-84	26	24	10

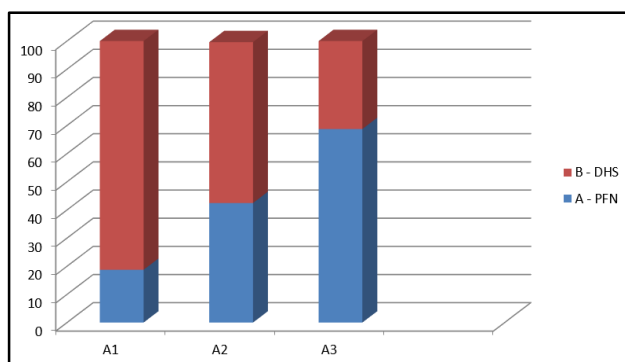
**Table 1. Study Groups**

**Classification**

Orthopaedic Trauma Association Alphanumeric classification (OTA/AO) was followed in sorting out the fractures. 32 cases were A1 (30.19%), out of which 6 cases (18.75%) were treated with PFN and 26 cases (81.25%) with DHS. Majority of the cases were A2 type- 42 cases (39.62%), 18 (42.86%) and 24 (57.14%) cases were treated with PFN and DHS, respectively. A3 type comprises 32 cases (30.19%) and PFN was done in 22 (68.75%) and DHS in 10 cases (31.25%).



**Graph 1. A1-32 Cases, A2-42 Cases, A3-32 Cases. Total = 106 Cases**



**Graph 2. Percentage Distribution of Cases**

**Exclusion Criteria**

1. Patients less than 60 years of age.
2. Bilateral fractures.
3. Pathological fractures.
4. Polytrauma cases.
5. Subtrochanteric fractures.

**METHODS**

All the patients were analysed according to the age of the patient, sex, fracture type, total operating time (from closed reduction to wound closure), time to union and complications.

The decision for the type of operation was based on the fracture pattern, surgeon’s preference and availability and cost of the implant. Each patient was thoroughly evaluated and the co-morbid conditions were properly managed prior to surgery. The overall time from injury to surgery averaged 3.6 days (1-7 days). All surgeries were done on standard fracture table under image intensifier.

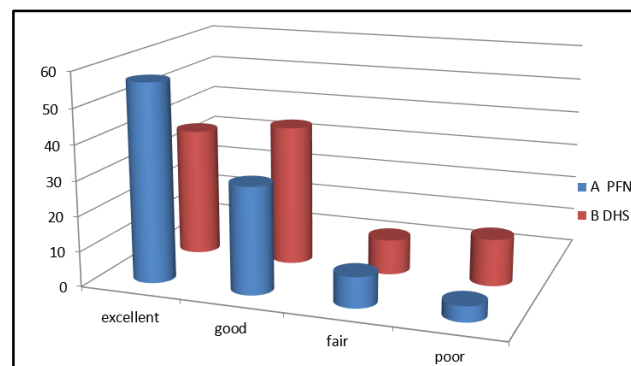
Complications were classified as intraoperative, early (first month after surgery) and late (after first month). Radiographic outcome of each group was analysed with anteroposterior and mediolateral radiographs at immediate postoperative and at each follow up visit. Fractures were considered to be healed if bridging callus was evident on three of four cortices as seen on two views.<sup>6</sup> Patients were followed up at regular intervals of four, eight and twelve weeks, six months and annually thereafter.

Functional outcome was analysed with Modified Harris Score. Harris Hip Score (HHS) was developed for the assessment of the results of hip surgery and is intended to evaluate various hip disabilities.

Maximum 100 Points	
Pain - 44	<70 - Poor
Function - 47	70-79 - Fair
(Activities of daily living – 14; Gait - 33)	
Range of motion - 5	80-89 - Good
Deformity - 4	90 -100 - Excellent
Score Interpretation	

**OBSERVATION AND RESULTS**

In this study, we had 26 excellent (56.5%), 14 good (30.4%), 4 fair (8.7%) and 2 poor (4.4%) results in Group A; whereas, 22 excellent (36.67%), 24 good (40%), 6 fair (10%) and 8 poor (13.33%) results in Group B.

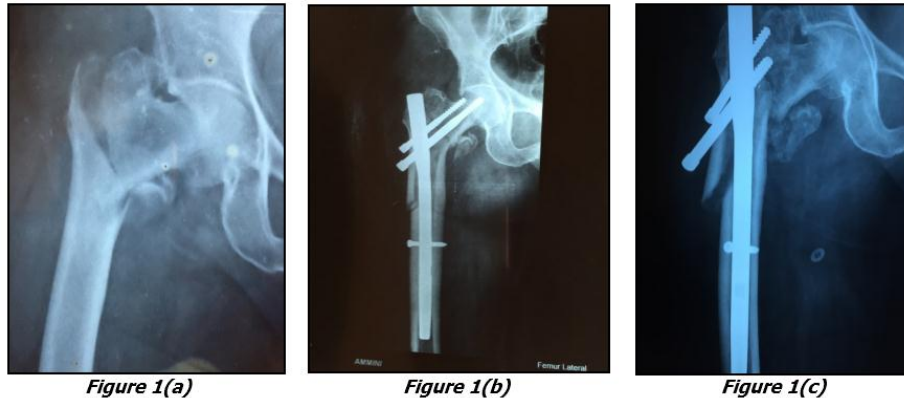


**Graph 3. Functional Results (Percentage)**

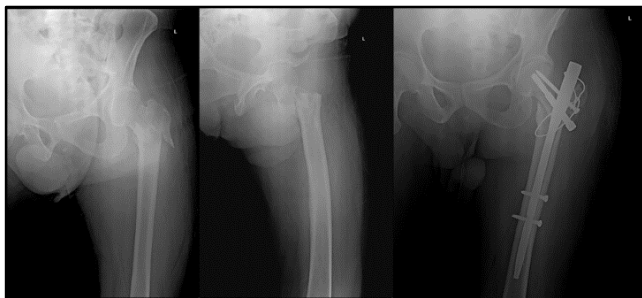
There were two intraoperative complications in group A. One was splintering of the lateral wall of greater trochanter, which was managed by open reduction and wiring. Another one, fracture of lateral wall of proximal shaft during nail insertion. In Group B, we had one case with loss of fixation in the immediate postoperative period.

Early complications noted were prolonged drainage, haematoma and superficial infection. Reduction loss, nonunion, implant failure and late infection were the late complications noticed. There was no "Z effect" or "reverse Z

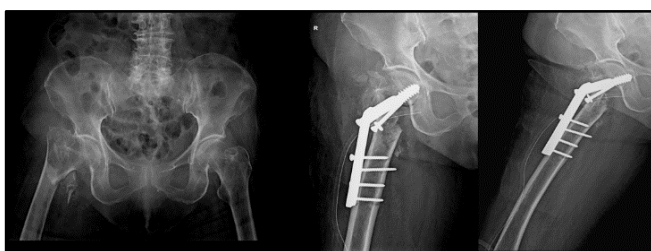
effect" noted in our study." But, both screws backing out with displacement of the fracture of lateral wall (occurred during surgery) was noted in one case after weight bearing<sup>6</sup> (Figure 1).



**Figure 1(a) A2 Fracture, (b) Fixed with PFN, Lateral Wall Fractured during Surgery was Left as Such, (c) Both the Screws Backing Out with Displacement of Lateral Wall Fracture After Weightbearing**



**Figure 2. A 3.3 Type Fracture- Splintering of Lateral Wall of Greater Trochanter Managed with Wiring**



**Figure 3. A 2.3 Type Fracture with Loss of Fixation Leading to Medialisation**

## DISCUSSION

A comparison of intraoperative, early and late complication rates revealed no significant difference between study groups. Duration of hospital stay, infection rate and implant failure rate in stable fractures are similar in both groups. There is also no significant difference in time to union. Smaller incision and significantly lower blood loss are advantages of PFN. Total duration of surgery is similar in both groups. This is in agreement with the findings of similar earlier studies.<sup>7</sup>The outcome of stable fractures treated with either DHS or PFN were similar.

## CONCLUSION

Unstable intertrochanteric fractures treated with PFN have significantly better outcome than DHS. In unstable fractures,

reduction loss, union in varus and limb shortening are significantly higher in DHS. Hence, the advantages of PFN are less surgical trauma, less blood loss and the possibility of early weightbearing even after very complex fractures.

## REFERENCES

- [1] Pajarinen J. Ptertrochanteric femoral fractures treated with a dynamic hip screw or a proximal femoral nail. A randomized study comparing rehabilitation. JBJS (Br) 2005;87(1):76-81.
- [2] Bucholz RW, Heckman JD, Court-Brown CM, et al. Rockwood and Green's fractures in adults. 6th edn. Vol. 2. Philadelphia: Lippincott Williams & Wilkins 2006:1797-1808.
- [3] Anglen JO, Weinstein JN. Nail or plate fixation of intertrochanteric hip fractures: changing pattern of practice. A review of American board of Orthopaedic Surgery Database. J Bone Joint Surg Am 2008;90(4):700-707.
- [4] Venkatesh Gupta SK, Valiseti VS. Comparative study between dynamic hip screw vs proximal femoral nailing in intertrochanteric fractures of the femur in adults. International Journal of Orthopaedics Sciences 2015;1(1):7-11.
- [5] Muller ME, Allogower M, Schneider R, et al. Manual of internal fixation: techniques recommended by the AO-ASIF Group. 3<sup>rd</sup> edn. New York: Springer-Verlag 1995.
- [6] Singh AP, Kochar V. Intramedullary nail versus dynamic hip screw. Trauma International 2015;1(1):17-20.
- [7] Gaurishankar D. Comparative study of PFN and DHS in proximal femoral fractures. International Journal of Recent Trends in Science and Technology 2014;12(3):531-533.