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# ORIGINAL ARTICLE

# COMPARATIVE STUDY BETWEEN DYNAMIC HIP SCREW VS PROXIMAL FEMORAL NAILING IN UNSTABLE INTER-TROCHANTERIC FRACTURES OF THE FEMUR IN ADULTS

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**ABSTRACT: BACKGROUND:** Inter-trochanteric fractures account for approximately half of the hip fractures in elderly; out of this, more than 50% fractures are unstable. The dynamic hip screw (DHS) has gained widespread acceptance in the last two decade and is currently considered as the standard device for comparison of outcomes. The DHS has been shown to produce good results but complications are frequent, particularly in unstable inter-trochanteric fracture. The advantage of Proximal Femur Nailing fixation is that it provides a more biomechanically stable construct by reducing the distance between hip joint and implant. **METHOD:** The goal of this study is to compare the clinical and radio graphical results of the DHS and PFN for the treatment of Intertrochanteric hip fractures (Load bearing vs Load shearing). In our study we included 68 intertrochanteric fractures, out of which 34 are treated with DHS fixation and 34 are treated with PFN. All surgeries done on traction table and are followed up at regular intervals of 4 weeks, 8 weeks, 12 weeks, 6months and annually thereafter. **RESULTS:** The functional results are assessed with Harris Hip Score and observed 50.00% excellent results in DHS group and 67.64% excellent results in PFN group. We observed no statistically significant difference between two groups in view and time to union. We observed significantly better outcomes in PFN group for unstable inter-trochanteric fractures and in unstable fractures reduction loss is significantly lower in PFN group. We observed total duration of surgery is significantly lower in PFN group. **CONCLUSION:** We concluded that PFN may be the better fixation device\for most unstable inter-trochanteric fractures.
**KEYWORDS:** DHS; PFN; Intertrochanteric fracture.

**INTRODUCTION:** Intertrochanteric fractures are most common in elderly population accounting 50% of total hip fractures of which more than 50% are unstable.[1] These fractures unite readily with conservative line of treatment but there is fear of complications like, malunion, shortening, and osteoarthritis of hip joint. Earlier active treatment was usually delayed for 3 to 4 weeks which lead to secondary complications.[2] Effective treatment strategies resulting in high rates of union of these fractures and low rates of complications are important. Generally, dynamic hip screw (DHS) internal fixation is one of the most primary options and for stable or minimally displaced peritrochanteric fractures, the DHS fixation produces reproducibly reliable results.[3] However, in unstable fractures, the DHS device performs less well with a relatively higher incidence of internal fixation failure.[4] The advantage of Proximal Femur Nailing fixation is that it provides a more biomechanically stable construct by reducing the distance between hip joint and implant[5] The goal of this study is to compare the clinical and radio graphical results of the DHS and PFN for the treatment of Inter-trochanteric hip fractures (Load bearing vs Load shearing).

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**MATERIAL AND METHODS:** 68 unstable intertrochanteric fractures which were surgically treated between January 2012 and January 2013 at our institution. The fractures were divided into two groups for analysis: Group 1(34): Fractures treated with DHS Group 2(34): fractures treated with PFN. The decision for the type of the operation was based on surgeon's preference and availability of the implant. Prior to hip surgery, each patient was evaluated by the same trauma team. All surgeries were performed on the traction table following closed reduction confirmed with fluoroscopy on two different planes Eligibility criteria for the patients included in the study were as follows: 1) Patients who were in the age group of more than 50 years of either sex, 2) Intertrochanteric fracture type 31-A2, 31-A3 (OTA classification) without any systemic or psychiatric illness, 3) patients fit for anaesthesia. The exclusion criteria were 1) Patients unfit for the surgery, 2) with compound or pathological fractures, 3) admitted for re-operation 4) those who have not given written consent for surgery. The clinical outcome for each group was analyzed, and intraoperative, early (and late complications (After first month) were recorded. Patients followed up at regular intervals of 4 weeks, 8 week, 12 weeks, 6 months and annually thereafter. Their functional outcome assessed with Harris Hip Scores.

**RESULTS:** The average duration of surgery for the PFN (Avg. time 48.73 min) was significantly shorter then DHS (Avg. time 69.03 min), p value < 0.0001 The average blood loss in the P.F.N group was 120 ml and in the DHS group was 250 ml. blood loss is less in PFN which is statistically significant, p value <0.0001. Average incision size for DHS was 6cm while for PFN group was 3cm. In 5 of the 34 cases operated with DHS Richard screw placement was improper due to reverse oblique nature of fracture and in 2 cases closed reduction was not achieved and open reduction was done. In 3 of the cases operated by PFN closed reduction was not achieved. There were no problems with screw placement in PFN group. The average fluoroscopy time used in PFN group was 67.40mins while in DHS group was 47.75mins.

**Functional Score:** In this study, patients with excellent results are 17(50.00%) in DHS group and 23 (67.64%) in PFN group, patients with good res5ults are 11(32.4) in DHS group and 10(29.41%) in PFN group, patients with fair results are 6(17.76%) in DHS group and 1(.5%) in PFN group and patients with poor results are 1(1.6%) in DHS group and no patient with poor results in PFN group. The sliding of both groups was compared at the end of 1 year on the X-rays as described by Hardy et al,[5] there was an average of 5.53 mm of sliding in the P.F.N group as compared to 8.10 mm in the D.H.S group. (p<0.0001)

Complications There were 3 cases of infection seen in the D.H.S group. 2 were seen within 3 weeks of surgery and were treated by local debridement and antibiotic and did not require implant removal. 1 which was acquired late required implant removal and was managed conservatively. No infection was seen in PFN group. 1 of 34 case of implant failure in P.F.N group and revision surgery was required for it. The usual 'Z' pattern of implant failure was the reason. In the D.H.S group there were 2 of 30 cases of implant failure one was due to screw cut out and other was due to plate breakage. In both the cases revision surgery was required.

**DISCUSSION:** A comparison of intra-operative, revealed no statistically significant differences between study groups (P = 0.324 for intra-operative complications). Total duration of surgery was significantly lower in PFN group than it was in DHS (p<0.005). Incision size was lower in PFN group

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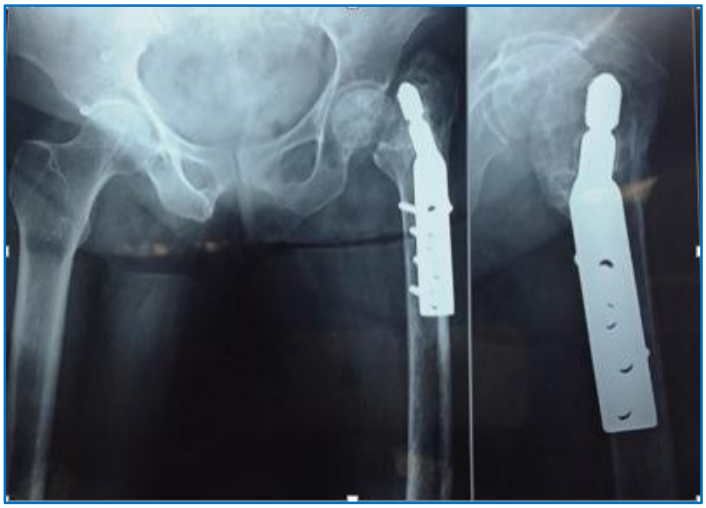
compared to DHS group (p<0.05).A comparison of time to union demonstrated no statistically significant differences between study groups (P= 0.542). Early and late postoperative complications were more in DHS group compared to PFN group. (p <0.05). Functional outcome of unstable inter-trochanteric fractures treated with PFN has significantly better outcomes with all having good results. Kulkarni GS et al[6] reviewed the current concepts of treatment of intertrochanteric fractures.

They concluded that unstable intertrochanteric fractures can be helped by intra medullary fixation as there is more failure of dynamic hip screw. Christian Boldin, Franz J. Seibert et al[7] in 2000 carried a prospective study of 55 patients having proximal femoral fractures treated with the proximal femoral nail. They achieved good results in most of the patients with very less complications at 12 month follow up. They concluded that proximal femoral nail is a good minimal invasive implant for unstable proximal femoral fractures. In our study we found: Less operative time in PFN group less operative blood loss in PFN group, early return to daily activities. Less complication in PFN group like less infection, less sliding, less limb length discrepancy compared to DHS group.

**CONCLUSION:** Though PFN and DHS have similar outcomes in stable fractures, PFN has better functional outcome with unstable fractures. PFN requires shorter operation time and smaller incision; it has distinct advantages over DHS even in stable inter-trochanteric fractures. Hence from our study, PFN may be the better fixation device for most unstable intertrochanteric fractures.

**Z effect seen in in pfn**



**Screw cutout seen after 6months in DHS group**

| Complications Early | DHS | PFN |
|---|---|---|
| Prolonged drainage | 3 | 0 |
| Superficial infection | 2 | 0 |
| Late | | |
| Non union | 2 | 1 |
| Implant failure | 2 | 1 |
| Late infection | 1 | 0 |

Table 1

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