

# Surgical Management of Comminuted Unstable Intertrochanteric Fracture with Proximal Femoral Nail: - A Retrospective Study

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**Abstract:** *Intertrochanteric fractures are one of the most common fractures in osteoporotic people. It is associated with high rates of morbidity and mortality. Management of Intertrochanteric fractures pose a great medical dilemma for clinicians. They treatment options have evolved over time from conservative management of such kind of fractures to use of cephalomedullary nails. This study was conducted to study outcome of Proximal Femoral Nail for the management of Intertrochanteric fractures. 12 patients were included in the study and mean NMS score was 7.5.*

**Keywords:** Intertrochanteric fractures , PFN , Comminution , Unstable

## 1. Introduction

Intertrochanteric fractures are one of the most common fractures encountered in an Orthopaedic trauma room, with most of the patients aged more than 60 years. Though many treatment modalities have been proposed, none have proved as definitive method<sup>1, 2, 3</sup> Treatment of choice depends on type of fracture, patient age, and skills of the surgeon. Various treatment modalities have been tried by various surgeons including conservative techniques, cephalomedullary nails and sliding hip screws.<sup>4,5,6</sup> There have been a lot of controversies surrounding superiority of DHS and PFN for the treatment of comminuted intertrochanteric fractures, but none have been definitely proven as better.<sup>4</sup>

PFN has been a relatively recent introduction for the treatment of unstable intertrochanteric fractures. It is very effective when the medial buttress is not maintained. The presence of a hip screw with an additional antirotation screw gives it additional stability over DHS. Shorter lever arm and reduced removal of bone are an added advantage.<sup>6, 7</sup>

We plan to study the results of PFN osteosynthesis, retrospectively for the treatment of unstable intertrochanteric fractures including complications and clinical features.

## 2. Patients and Methods

All the patients who were operated for intertrochanteric fractures with Proximal Femoral Nail in this tertiary care hospital between August 2015 and February 2016 were called up for follow up. They were divided into 3 groups 1 month follow up, 3 months follow up and 6 months follow up. Patients were examined clinically for hip range of movement, gait and weight bearing, deformities including rotational and coronal plane deformities. X-rays were taken of the hip, both Antero Posterior and Lateral views and compared with immediate post-operative x-rays to look for

signs of union and other screw related complications. Patients were then encouraged for further follow up. A total of 12 patients were operated out which 3 patients passed away due to natural reasons. Tip Apex Distance<sup>10</sup> and Cleveland method<sup>8</sup> was used for the evaluation of placement of head screw whereas new mobility score was used for clinical evaluation of patient.

Fractures were classified on the basis of AO/OTA classification system<sup>9</sup>. Tip Apex distance was defined as the distance between the tip of the hip screw and the center of the femoral head in both AP and Lateral view. Cleveland method divided the femoral head in to 9 quadrants for correct determination of the placement of the hip screw on lateral X-ray.

All patients were preoperatively assessed to rule out any comorbid conditions or any other medical contraindication for surgery. Patients were graded according to ASA criteria<sup>11</sup>. Preoperative antibiotics and anti-platelet treatment was given to all patients. For follow-up, patients were contacted on the phone and clinical examination status was calculated on the basis of new mobility score (NMS)<sup>13</sup>, ranging from immobile to independently mobile.

## 3. Results

The mean age of surgery was 64.5 years with SD 9.86. Out of 44 patients with Intertrochanteric fracture 12 were treated with Proximal Femoral Nail. There were 7 males and 5 females. Majority of the fractures were caused due to trivial fall<sup>10</sup> whereas 1 case was due to fall from 10 feet height and 1 was a road traffic injury. The fracture was classified on the basis of AO/OTA classification. Majority fractures were unstable fractures with 7 type A2 and 5 type A3 fractures. 8 of them were left sided fractures whereas only 4 of them right sided. On Radiological Assessment post operatively the most common zone for hip screw placement on lateral x-ray was central- central (8/12) whereas 4 were in central-

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inferior. The average TAD was 24.67 mm with SD 1.37. The Post-operative New Mobility Score was calculated on the basis of ability of patients to carry their daily activities. The average NMS came out to be 7.5, SD 0.67 with maximum being 8 and minimum 6.

New Mobility Score	No. of Patients
8	7
7	4
6	1

0	0	0
0	8	0
0	4	0

On Post-operative follow-up after 6 months, good fracture consolidation was appreciated in all the patients. Lateral sliding with cephalad cut out was seen in 1 patient in which the fracture fell in the A3 type with severe comminution. The same patient was lost in follow-up, the same patient was encouraged for delayed weight bearing.



#### 4. Discussion

With the development of intramedullary devices and nail systems, a new phase has started in the treatment of Intertrochanteric fractures. A general rule which governs the surgical treatment is, achieving a stable fixation.

A PFNA consists of two screws, a larger head screw, which provides fixation and compression and a smaller antirotationscrew, meant to provide rotational stability. The length of antirotation screw is important to prevent implant failure. When the anti-rotation screw is longer or of same length as the hip screw there are higher chances of screw cut out. The cut out rate with PFN is 0.6 – 8%<sup>14,15,16</sup> whereas in our study it was around 0.83%. The lag screw should be inserted as deep as the subchondral bone. On lateral X-ray, the ideal location would be Central – Central or just inferior to it<sup>17,18</sup>. In our study, 67% of the cases had lag screws in the central – central zone while rest of 23% had in the central inferior location. Screw cut out is most common when it is placed in the superior zone of the head which happens to be the weakest zone<sup>19</sup>.

Lateral slide of the Hip screw is common as the fracture consolidates over time though we didn't encounter a lateral slide in any of our cases in 6 months of follow-up. The patients were assessed on the basis of New Mobility Score, which happens to be more practical way of assessment for Indian population<sup>13</sup>

Walking ability	No difficulty	Alone with an assistive device	With help from another person	Not at all
Able to walk inside house	3	2	1	0
Able to walk outside house	3	2	1	0
Able to go shopping, to a restaurant, or to visit family	3	2	1	0

The maximum score is 9 where the patient is freely mobile whereas the lowest score is 0 associated with maximum morbidity.

#### 5. Conclusion

PFN is undoubtedly an excellent tool in the hand of the surgeon for the treatment of unstable Intertrochanteric fracture. But results depend on the Techniques and the skill of the surgeon as well.

For more conclusive results a longer follow-up is required.

NOTE

Conflict of interest – None

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