

Outcome of Inter-Trochanteric Fracture Femur Treated with Long Proximal Femoral Nail

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Abstract:

Background and Objectives: Inter-trochanteric fractures are one of the most commonly encountered fractures in osteoporotic population and high velocity trauma cases causing high morbidity and mortality. Advantage of PFN fixation is, it is a weight sharing implant rather than weight bearing and very few complications such as malunion or non-union were reported.

Present study was done to analyze functional outcome of long proximal femoral nail in cases of inter-trochanteric fractures.

Material and Methods: This prospective study was conducted in a tertiary centre of central India, in the time period from December 2022 to December 2023, in 50 patients with inter-trochanteric fracture femur. All patients analyzed using Harris Hip Score at 3 month and 6 month post operatively.

Results: Our study showed 50% of patients belong to Boyd and Griffin type 2. 50% of patients achieved Harris hip score >90 shows excellent functional outcome of PFN in Intertrochanteric fractures.

Patients with surgical site infection and osteomyelitis treated with long duration of intravenous and oral antibiotics. 3 patients sustained varus collapse and in 2 patients screws backed out due to Z effect.

Conclusion: Proximal femoral nails demonstrated a good functional outcome and fewer complications in our study. We suggest PFN as the preferred implant for treating unstable trochanteric fractures based on the findings of our study and the body of current literature. With correct technique execution and adherence to PFN fixation principles, complications can be reduced to an acceptable rate even if PFN is also linked to implant failure and other complications.

Keywords: Functional outcome; Harris Hip Score; Inter-trochanteric Fracture Femur; Proximal femoral nail.

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Introduction

Inter-trochanteric fractures are one of the most commonly encountered fractures in osteoporotic population and high velocity trauma cases causing high morbidity and mortality. [1]

Accounting 10 to 34% of all fractures. [2] Estimated incidence is around 15-20 per 100,000 individuals. [3] Common modalities used for fixation of these fractures includes closed reduction and internal fixation with Cannulated cancellous screw (CC screw), Dynamic hip screw (DHS), Proximal femoral nail (PFN). [4] Advantage of PFN fixation is, it is a weight sharing implant rather than weight bearing and very few complications such as malunion or non-union were reported. [5,6]

Aim and Objectives:

To analyze functional outcome of long proximal femoral nail in cases of inter-trochanteric fractures.

Material and Methods:

This prospective study conducted on central Indian population in the time period from December 2022 to December 2023 in patients with inter-trochanteric fracture femur.

50 Patients enrolled on the basis of inclusion and exclusion criteria's. All patients analyzed using Harris Hip Score at 3 month and 6 month post operatively.

Inclusion criteria:

1. Age above 18 years
2. Boyd and Griffin type 1,2,3 and 4 inter-trochanteric fracture femur

3. Independently ambulatory before sustaining the fracture

3. Pathological fractures

4. Bilateral lower limb injury or unilateral associated lower limb injuries

Exclusion Criteria:

1. Age below 18 years and above 80 years
2. Open fractures, Neurovascular injuries

Results:

Table 1: Age distribution among patients

| Age | Frequency | Percentage |
|-------------|-----------|------------|
| 18-30 years | 9 | 18% |
| 31-40 years | 15 | 30% |
| 41-50 years | 8 | 16% |
| 51-60 years | 6 | 12% |
| >60 years | 12 | 24% |
| Total | 50 | 100% |

Table 2: Sex Distribution among patients

| Sex | Frequency | Percentage |
|--------|-----------|------------|
| Male | 28 | 56% |
| Female | 22 | 44% |
| Total | 50 | 100% |

Table 3: Mode of injury among patients

| Mode of injury | Frequency | Percentage |
|-----------------------|-----------|------------|
| Road traffic accident | 29 | 58% |
| Slip and fall | 18 | 36% |
| Fall from height | 3 | 6% |
| Total | 50 | 100% |

Table 4: Fracture Classification among patients

| Boyd and Griffin classification | Frequency | Percentage |
|---------------------------------|-----------|------------|
| Type 1 | 8 | 16% |
| Type 2 | 25 | 50% |
| Type 3 | 8 | 16% |
| Type 4 | 9 | 18% |
| Total | 50 | 100% |

Table 5: Harris Hip score at 6 months follow-up

| Harris Hip score | Frequency | Percentage |
|------------------|-----------|------------|
| ≤70 | 5 | 10% |
| 71-80 | 6 | 12% |
| 81-90 | 14 | 28% |
| >90 | 25 | 50% |
| Total | 50 | 100% |

Table 6: Complications among patient following surgery

| Complication | Frequency | Percentage |
|-------------------------|-----------|------------|
| Surgical site infection | 3 | 6% |
| Deep Vein Thrombosis | 1 | 2% |
| Osteomyelitis | 2 | 4% |
| Varus collapse | 3 | 6% |
| Z effect | 2 | 4% |
| Knee stiffness | 5 | 10% |
| Nil | 30 | 60% |



Figure 1: Clinical pictures at 6 month follow up

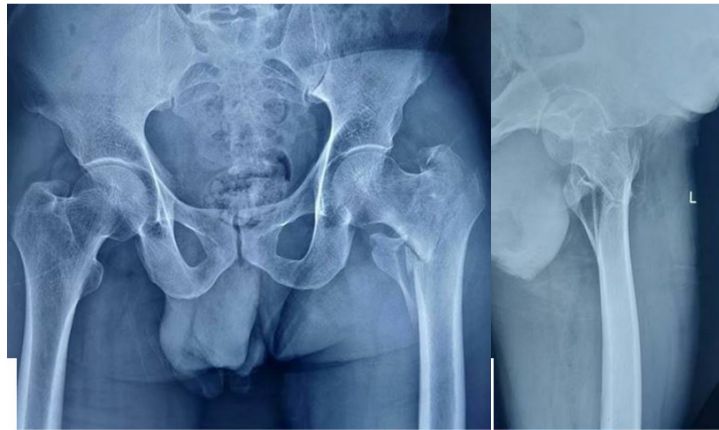


Figure 2: Pre op radiographic image



Figure 3: Radiographic image at immediate post op

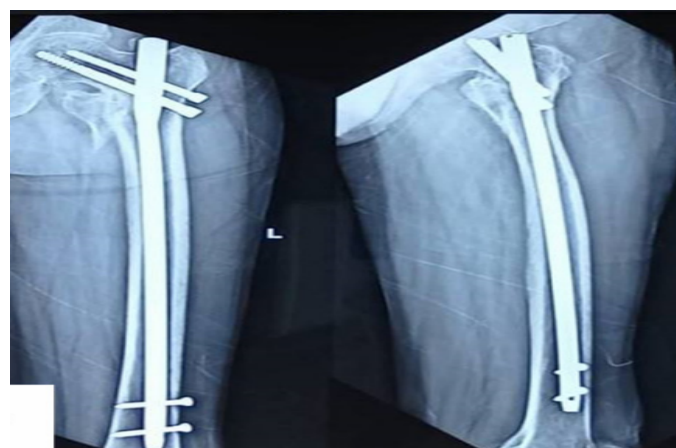


Figure 4: Radiographic image at 6 month follow up

Discussion

Inter trochanteric fractures are best treated operatively worldwide. Modern orthopaedic practices for these fractures are focused on early mobilization, rigid and stable fixation and maintenance of limb length.

Several fixation devices have been tried for fixation of these fractures such as Cannulated cancellous screws, Dynamic hip screws, and intramedullary devices.

Kuntscher, Zickle, Grosse, Kempf and Russel and Taylor developed intramedullary nail (IMN) with sliding hip screw (SHS). [7-9]

The first successful intramedullary device was developed by Zickel in the early 1960s, since then it gained great popularity in orthopaedic community for fixation of intertrochanteric femur fractures due to its superior biomechanical properties when compared to other modes of fixation.

In this study, bimodal distribution of age is seen among patients (Table 1) in middle aged adults and old age.

Among patients males are more commonly affected than females (Table 2) which is comparable with studies conducted by Shishir et al. [10] with 53% male patients, Nagraj et al. [11] with 60% male patients.

Our study showed 50% of patients belong to Boyd and Griffin type 2 which is comparable with Dhruvil et al. [12] study with 42% patient belong to Boyd and Griffin type 2.

50% of patients achieved Harris hip score >90 shows excellent functional outcome of PFN in Intertrochanteric fractures.

Patients with surgical site infection and osteomyelitis treated with long duration of intravenous and oral antibiotics. 3 patients sustained varus collapse and in 2 patients screws backed out due to Z effect.

Conclusion

Proximal femoral nails demonstrated a good functional outcome and fewer complications in our study. We suggest PFN as the preferred implant for treating unstable trochanteric fractures based on the findings of our study and the body of current literature. With correct technique execution and adherence to PFN fixation principles, complications can be reduced to an acceptable rate

even if PFN is also linked to implant failure and other complications.

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