

## “Operative outcome of Trochanteric femoral nailing for intertrochanteric fractures of femur in adults”

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### Abstract:

**Context:** Intertrochanteric fractures account for half of proximal femur fractures. This extra capsular fracture occurs in cancellous bone with abundant blood supply. As a result non union and osteonecrosis are not a major problem but deforming muscle forces will produce shortening, external rotation and varus malposition.

**Aims:** To study the clinical, radiological and functional outcomes, and complications associated with the trochanteric femoral nailing in intertrochanteric fractures of femur.

**Materials and methods:** Trochanteric Femoral Nailing of 20 cases of Intertrochanteric fractures and evaluation of the results. Statistical Analysis Used: Patients evaluated clinically and radiologically, at regular intervals.

**Results:** Out of 20 patients, according to the Modified Harris Hip Scoring system, 13 patient had excellent results, 6 patients had good result, 1 patient had fair result. Radiological union was achieved in 8-12 weeks. Complication rate was 20%.

**Conclusions:** Intramedullary devices like trochanteric femoral nail is a good option for both stable and unstable intertrochanteric fractures

**Keywords:** Trochanteric femoral nail, proximal femur, intramedullary, hip fractures

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### I. Introduction

Intertrochanteric fractures account for nearly 50% of all proximal femur fractures. Average age of incidence is 66 to 77 years. F:M=2:1 to 8:1 probably due to post menopausal metabolic changes in bone and 90% are due to simple fall in elderly individuals, mostly due to direct impact of greater trochanter. Factors associated with trochanteric fractures are

- Advancing age
- Increase dependent activity in daily living
- Increase number of co-morbidity
- History of other osteoporotic related factor.<sup>[1]</sup>

Among operative modalities, extra-medullary and intra-medullary devices are available. Intra-medullary fixation is emerging now a days because of a short lever arm, load sharing device, location of screw nail junction within medullary cavity that prevents bending forces, varus collapse, less soft tissue injury, less blood loss, decreasing post operative morbidity.<sup>[1]</sup> Disadvantages of extramedullary devices are shortening of limb, varus collapse, iatrogenic lateral cortex break, and unsuitable for unstable fracture. It is better than extramedullary implants in many aspects like improved biomechanics and improved biological fixation.<sup>[2]</sup> Trochanteric femoral nail system consists of a series of cannulated nails, helical blade, end caps and locking bolts and screws. It has great resistance to cut out and prevention of varus collapse, femoral head rotation. The aim of our study is to find out the functional outcome of trochanteric femoral nailing and simultaneously, evaluating the advantages and disadvantages.

### II. Aims & objectives

- To assess outcome on the basis of clinic-radiological parameters.
- To assess functional outcome of study
- To find out the advantages, disadvantages and complications of the procedure.

### **III. Materials and methods**

The study has been conducted after obtaining clearance from institutional ethical committee with informed consent from participating patients.

**STUDY POPULATION:** Patients attending OPD and emergency >14 years with trochanteric fractures in a peripheral tertiary care institute.

#### **Inclusion criteria:**

- Age of patient >14 years
- Stable and unstable trochanteric fractures

#### **Exclusion criteria:**

- of patient <14 years
- Age Operative treatment is treatment of choice for trochanteric fractures, except
- Non ambulatory patient
- Chronic dementia
- Terminal diseases with <6 weeks life expectancy
- Active infectious disease
  
- Medical co-morbidity precluding surgical outcome

3. **Study Period:** 1.5 years

4. **Sample Size:** 20 patients

5. **Sample Design:** Patients meeting the Inclusion Criteria will be included in this study one by one till the desired sample size is obtained.

6. **Study Design:** It is a prospective study. The patients will be examined thoroughly with emphasis on radiological, functional, socioeconomic status. Operative intervention will be done on due course and post operative follow up will be done at 4 weeks, 6 weeks, 8 weeks, and 3 months. Thereafter, the cases are followed up every 3 months up to 1 year. Pre and post operative radiological and functional outcome will be compared.

#### **7. Parameters To Be Studied**

##### **A) Clinical Parameters**

To be determined by Modified Harris Hip score.

##### **B) Radiological Parameters**

- i. Neck shaft angle (to assess varus valgus angulations)
- ii. Postero medial cortex and position of lesser trochanter
- iii. Shenton's line

##### **8) Study Tools**

- A. Measuring tape
- B. Goniometer
- C. Radiograph
- D. CT scan
- E. MRI
- F. Image intensifier
- G. Surgical instruments

##### **9) Study Technique**

- a. Clinical evaluation will be done by modified Harris hip score
- b. Radiological evaluation to be done in both pre and post operative period
- c. Statistical analysis to be done thereafter

##### **10) Plan For Analysis Of Data**

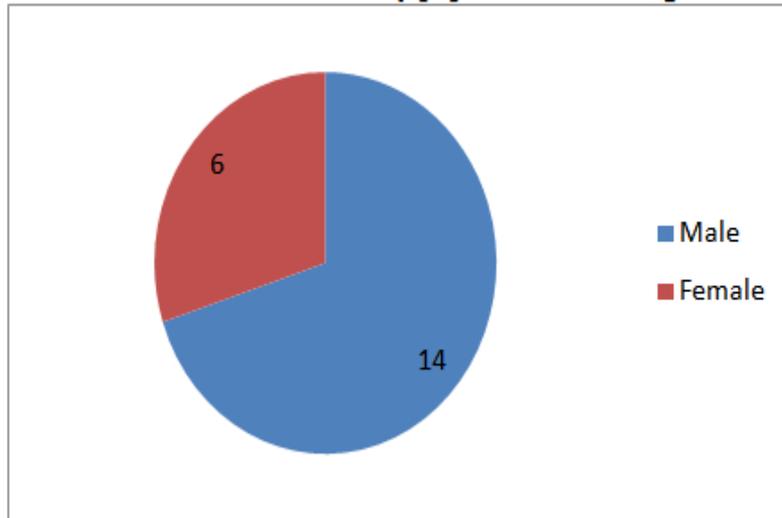
Patients in this study after operative intervention will be evaluated by clinical and radiological parameters, and statistical significance will be sought by comparing clinical, radiological and functional parameters in pre and post operative periods.

**IV. Results and analysis**

Age group	No.	Perc (%)
21-30	2	10
31-40	4	20
41-50	8	40
51-60	5	25
61-70	1	5
Total	20	100

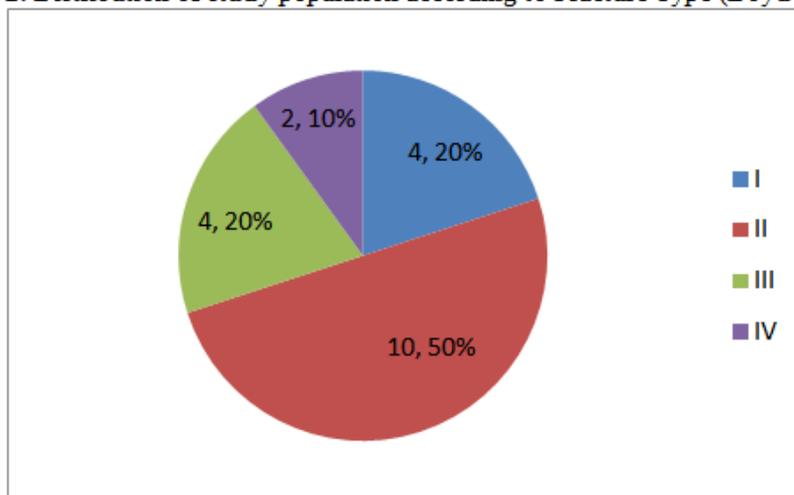
Mean age was 45.75 years. (Range 30-65 years)

**Chart 1: Distribution of study population according to sex**



Males were predominantly affected.

**Chart 2: Distribution of study population according to Fracture Type (Boyd Griffin)**

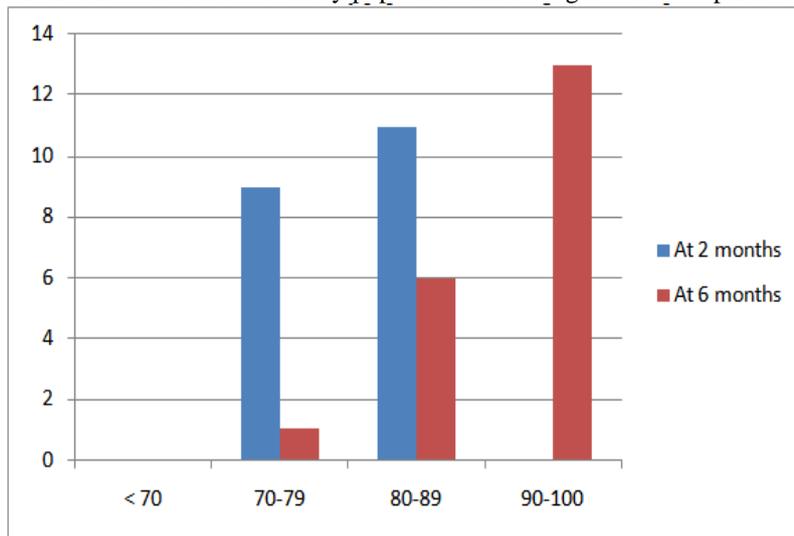


Boyd Griffin Type II fractures were most commonly encountered in our study.

**Table 2: Distribution of study population according to Mode of Injury**

Mode	No	Perc
Simple Fall	8	40
RTA	12	60
Total	20	100

**Chart 3:** Distribution of study population according to Harris Hip Score



Harris Hip Scoring was done at 2 months and 6 months.

**Table 3:** Distribution of study population according to Complications

Superficial Infection	4
Deep Infection <sup>#</sup>	1
Screw cut out	1
<b>Total<sup>#</sup></b>	<b>5</b>

# One case had both superficial and deep infection

## V. Discussion

Intramedullary devices like the trochanteric femoral nail has a short lever arm, and this biomechanical advantage is important particularly in unstable trochanteric and subtrochanteric fractures.<sup>[4,5]</sup> In our study, out of 20 patients, 14 patients were male and 6 were female. This is due to the more active life-style of male in Indian population. The result were opposite to the study done by David G. Lovelle,<sup>[6]</sup> who found trochanteric fractures more common in women and the ratio of female to male 3:1 but Gadgone and Salphale et al found 62% male and 38% were female in their study.[10] Our study had patients with age ranging from 30-65 years with a mean age of 45.75 years. Most of the injuries were due to road traffic accidents (60%) followed by simple fall (40%). Most of the literatures suggest that intertrochanteric fractures are common in the elderly and occur due to simple fall. This is a contradiction to our study which had a predominantly younger population.

In our study mean average delay for surgery was 12 days (range 5 to 21 days) as patient was not fit for surgery at the time of presentation. In a study by Rahul M Salunkhe et al had average hospital stay of 12.5 days. The fracture consolidated in all 20 patients. 2 patients (10%) showed signs of union at the end of 8 weeks and 18 patients (90%) showed union by end of 18 weeks. Gadgone and Salphale in their study had similar findings that had union in all cases between 15 weeks to 21 weeks using Proximal Femoral nail.<sup>[7]</sup>

Complication included fixation in varus in 1 patient. Post operatively there was superficial infection in 4 patients (20%). 1 patient also had deep infection (5%) that required debridement. In a study by Crawford and Malkani, out of the 59 patients treated with trochanteric nail, 3 patients (7%) had lag screw cut-out, one patient (2%) sustained a femoral fracture at the distal tip of the nail and there was one case (2%) of non-union. There was no case of infection in this study.<sup>[3]</sup> Most patients were discharged from the hospital on the 5th day and stitch removal was done after 14 days of surgery. On follow up the activity level and Harris Hip was checked at regular interval at 4 weeks, 6 weeks, 8 weeks, 3 months and thereafter every 3 months. As per Harris hip score, 13 patients (65%) had excellent results with score more than 90, 6 patients (30%) had good result with score between 80-90, 1 patient (5%) had fair result with score between 70-80 and none had poor result.

## VI. Conclusion

Intramedullary devices like trochanteric femoral nail is a good option for both stable and unstable intertrochanteric fractures of femur as they have the advantages of early weight bearing, low complication rate, decreased operative time, less blood loss, high rate of bony union and excellent functional outcome.

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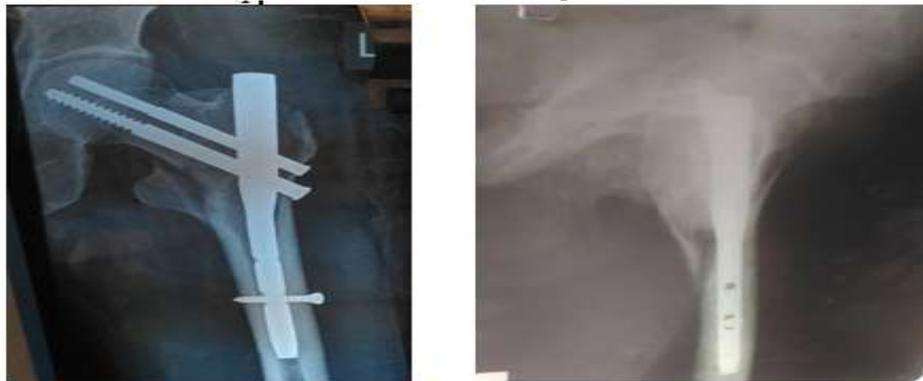
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**Case photos:**

Pre Operative



1 month follow up



3 months follow up

Functional Results after 6 months



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