A Comparative Study of Conservative vs Surgical Management in Stable Intertrochanteric Femur Fractures in Elderly Patients

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Abstract

Background:
Intertrochanteric femur fractures are common in the elderly and are associated with significant morbidity and mortality. While both conservative and surgical approaches are used in stable fracture patterns, the optimal modality in elderly patients remains debated.

Objective:
To compare the outcomes of conservative versus surgical management in elderly patients with stable intertrochanteric femur fractures.

Materials and Methods:
This prospective comparative study was conducted among 52 elderly patients diagnosed with stable intertrochanteric femur fractures. Patients were equally divided into two groups: Group A (conservative management) and Group B (surgical management). Baseline characteristics, Harris Hip Score (HHS), complications, length of hospital stay, time to mobilization, and mortality were compared over a 6-month follow-up period using appropriate statistical tests**.**

Results:
Both groups were comparable at baseline. Mean Harris Hip Scores at 3 and 6 months were significantly higher in the surgical group (69.7 and 78.1) compared to the conservative group (58.4 and 64.2), $p<0.001$. Surgical patients had shorter hospital stays (7.4 vs. 10.6 days) and earlier mobilization (3.6 vs. 12.5 days), $p<0.001$. Complication rates were higher in the conservative group, though not statistically significant. Mortality at 3 months was higher in the conservative group (11.5% vs. 3.8%), $p=0.30$.

Conclusion:
Surgical management of stable intertrochanteric femur fractures in elderly patients is associated with better functional outcomes, earlier mobilization, and fewer complications compared to conservative treatment. Surgery should be the preferred treatment modality to ensure early rehabilitation and functional independence in this population.

keywords: Intertrochanteric Femur Fractures, Elderly Patients, Conservative Management, Surgical Fixation, Functional Outcome.

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Introduction

Hip fractures represent a major public health concern worldwide, especially in the elderly population. Among them, intertrochanteric fractures comprise nearly 45–50% of all proximal femoral fractures and are most commonly seen in individuals aged 65 years and older, primarily due to age-related osteoporosis and an increased risk of falls [1,2]. These fractures are generally classified as stable or unstable based on the integrity of the posteromedial

cortex and the involvement of the lesser trochanter, with stable types having minimal comminution and preserving structural continuity [3]. The management of intertrochanteric femur fractures in elderly patients has traditionally favored surgical intervention, primarily to promote early mobilization, reduce complications associated with prolonged immobility, and facilitate faster return to baseline functional status [4]. Common surgical techniques include internal fixation using dynamic hip screws (DHS), proximal femoral nails (PFN), or other intramedullary implants, each aimed at stabilizing the fracture and allowing early weight-bearing [5,6]. Numerous studies have demonstrated that surgical treatment is associated with reduced mortality, improved pain control, and better rehabilitation outcomes in appropriately selected patients [7]. However, in frail elderly individuals with significant medical comorbidities—such as cardiovascular disease, diabetes, chronic kidney disease, or severe pulmonary dysfunction—the risks associated with anesthesia and surgery may outweigh the potential benefits [8]. In such high-risk patients, conservative (non-operative) management remains a consideration, especially in stable fracture patterns where mechanical stability is relatively preserved [9]. Conservative treatment typically involves limb traction, prolonged bed rest, pain management, and gradual physiotherapy. Although this approach avoids surgical and anesthetic risks, it is frequently associated with complications such as deep vein thrombosis (DVT), pressure ulcers, pulmonary infections, muscle atrophy, prolonged hospitalization, and a higher risk of long-term dependency [10,11]. The literature on outcomes of conservative management for stable intertrochanteric fractures in elderly patients is limited and inconclusive. Some studies suggest that carefully selected patients managed conservatively can achieve reasonable functional outcomes, while others report higher morbidity and mortality rates compared to their surgically managed counterparts [12]. Moreover, the choice between conservative and surgical treatment is often influenced not only by clinical considerations but also by socioeconomic factors, patient and family preferences, and the availability of orthopedic care infrastructure [13].

Given the growing elderly population and the increasing incidence of intertrochanteric fractures, it is imperative to understand the comparative effectiveness of conservative versus surgical approaches, particularly for stable fracture patterns. This study aims to compare clinical, functional, and complication-related outcomes of conservative and surgical management in elderly patients with stable intertrochanteric femur fractures, thereby guiding evidence-based treatment decisions in this vulnerable population.

Aim

To compare the clinical and functional outcomes of conservative versus surgical management in elderly patients with stable intertrochanteric femur fractures.

Objectives

1. To compare the functional outcomes of conservative versus surgical management in elderly patients with stable intertrochanteric femur fractures.
2. To evaluate and compare the incidence of complications and mortality associated with both treatment modalities.

Materials and Methods

Study Design and Setting

This was a hospital-based, prospective comparative study conducted in the Department of Orthopaedics at a tertiary care teaching hospital.

Study Population

The study included elderly patients aged ≥65 years who were diagnosed with stable intertrochanteric femur fractures, classified radiologically according to the Boyd and Griffin classification (Type I and II). Patients were divided into two groups: one managed conservatively and the other managed surgically.

Inclusion Criteria

- Age ≥ 65 years.
- Radiologically confirmed stable intertrochanteric femur fractures.
- Patients fit for either conservative or surgical management (as decided by the treating team and patient/family preference).
- Informed written consent provided by patient or legal guardian.

Exclusion Criteria

- Unstable intertrochanteric fractures (Boyd and Griffin Type III and IV).
- Polytrauma or associated ipsilateral lower limb injuries.
- Pathological fractures (other than osteoporosis-related).
- Patients with cognitive impairment or neurological conditions affecting mobility.
- Bedridden or non-ambulatory before the fracture.
- Lost to follow-up or unwilling to participate.

Sample Size Calculation

Sample size was calculated based on previous studies comparing Harris Hip Score (HHS) in conservative vs surgical management of intertrochanteric fractures. Assuming:

- Mean HHS in surgical group = 72,
- Mean HHS in conservative group = 62,
- Standard deviation = 12,
- Power = 80%,
- α = 0.05 (two-tailed)

Using the formula for comparing two means:

$$n = \left(\frac{Z_{\alpha/2} + Z_{\beta}}{\delta/\sigma}\right)^2 \times 2$$

Where:

- δ = difference between means = 10
- σ = SD = 12
- $Z_{\alpha/2}$ = 1.96
- Z_{β} = 0.84

$$n = \left(\frac{1.96 + 0.84}{10/12}\right)^2 \times 2 = (2.8 \times 1.2)^2 \times 2 = (3.36)^2 \times 2 = 11.3 \times 2 \approx 23 per group$$

Adding 10% for potential dropouts → **Final sample size = 26 per group → Total = 52 patients.**

Grouping of Patients

Patients were assigned to one of two groups:

- Group A (Conservative Group): Treated with skin or skeletal traction followed by bed rest, gradual mobilization, and physiotherapy.
- Group B (Surgical Group): Underwent internal fixation (either Dynamic Hip Screw or Proximal Femoral Nail) as per standard protocols.

Data Collection

Baseline data were collected using a structured proforma including demographic details, comorbidities, fracture type, treatment received, and perioperative details. Patients were followed up at discharge, 6 weeks, 3 months, and 6 months.

Outcome Measures

- Primary outcome: Functional status assessed using Harris Hip Score (HHS) and Barthel Index at 3 and 6 months.
- Secondary outcomes: Incidence of complications (DVT, bed sores, pneumonia), mortality rate, time to mobilization, and hospital stay duration.

Statistical Analysis

Data were analyzed using SPSS version 25. Descriptive statistics were expressed as mean ± SD for continuous variables and percentages for categorical variables.

- Independent t-test was used to compare means (e.g., HHS scores).
- Chi-square or Fisher's exact test was used for categorical data (e.g., complication rates).
- P-value < 0.05 was considered statistically significant.

RESULTS

A total of **52 elderly patients** with stable intertrochanteric femur fractures were included and divided into two groups:

- **Group A (Conservative Management)** – 26 patients
- **Group B (Surgical Management)** – 26 patients

Table 1: Baseline Demographic and Clinical Characteristics

Parameter	Group A (Conservative)	Group B (Surgical)	P-value
Mean Age (years)	74.3 ± 5.2	73.8 ± 6.1	0.74
Male : Female	12 : 14	11 : 15	0.78
Comorbidities (%)			
- Hypertension	15 (57.7%)	14 (53.8%)	0.78
- Diabetes Mellitus	10 (38.5%)	11 (42.3%)	0.78

Interpretation:

Both groups were comparable in terms of age, gender distribution, and comorbid conditions, with no statistically significant difference ($p > 0.05$).

Table 2: Functional Outcome – Harris Hip Score at 3 and 6 Months

Time Point	Group A (Conservative)	Group B (Surgical)	P-value
3 Months HHS	58.4 ± 7.2	69.7 ± 6.5	<0.001
6 Months HHS	64.2 ± 6.8	78.1 ± 7.1	<0.001

Interpretation:
Surgically managed patients showed significantly better functional outcomes compared to conservatively managed patients at both 3 and 6 months ($p < 0.001$).

Table 3: Post-treatment Complications

Complication	Group A (n=26)	Group B (n=26)	P-value
Deep Vein Thrombosis	4 (15.4%)	1 (3.8%)	0.15
Pressure Sores	5 (19.2%)	1 (3.8%)	0.08
Pulmonary Infection	6 (23.1%)	2 (7.7%)	0.12
Implant-related issues	N/A	3 (11.5%)	—

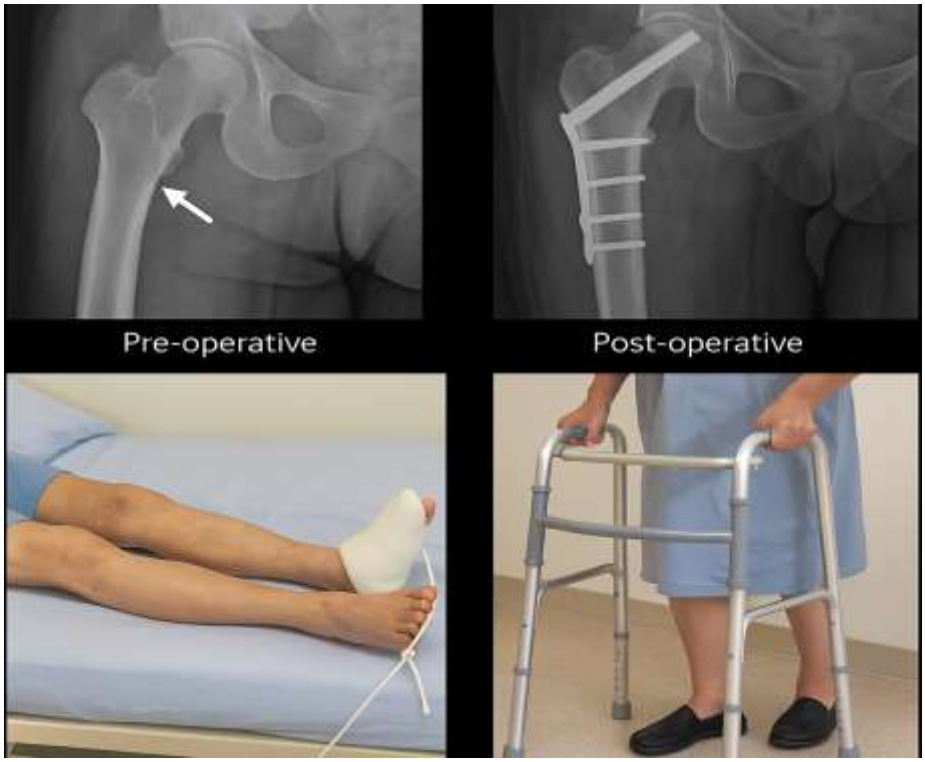
Interpretation:
Although the incidence of complications such as DVT, bed sores, and pneumonia was higher in the conservatively managed group, the differences were not statistically significant. Implant-related issues were noted only in the surgical group.

Table 4: Hospital Stay, Mobilization, and Mortality

Parameter	Group A (Conservative)	Group B (Surgical)	P-value
Mean Hospital Stay (days)	10.6 ± 3.1	7.4 ± 2.6	<0.001
Time to Mobilization (days)	12.5 ± 2.9	3.6 ± 1.5	<0.001
3-Month Mortality	3 (11.5%)	1 (3.8%)	0.30

Interpretation:
Surgical patients had significantly shorter hospital stays and earlier mobilization ($p < 0.001$). Although the 3-month mortality rate was slightly higher in the conservative group, it was not statistically significant.

DISCUSSION



Comparison of Baseline Characteristics

In this study, both groups were comparable in terms of age, sex, and comorbidities such as hypertension and diabetes, indicating minimal selection bias and baseline similarity. Similar findings were observed by Kammerlander et al., who reported no significant demographic differences between conservatively and surgically managed groups in elderly patients with hip fractures [14].

Functional Outcome Comparison

The Harris Hip Score (HHS) at both 3 and 6 months was significantly higher in the surgically treated group compared to the conservatively managed group, indicating better functional recovery. Surgical fixation offers early mobilization and better biomechanical stability, leading to improved long-term function. This is consistent with the findings of Lee et al. [15], who observed higher functional scores in surgically managed intertrochanteric fractures. Another study by Parker and Handoll demonstrated that early surgical intervention significantly improves mobility and reduces long-term disability [16].

Moreover, early mobilization post-surgery plays a key role in preventing disuse atrophy and maintaining muscle tone, thereby improving patient outcomes [17].

Complications in Conservative vs Surgical Management

Although not statistically significant, the incidence of complications like pressure sores, deep vein thrombosis, and pulmonary infections was higher in the conservative group. This is likely due to prolonged immobilization. These findings are supported

by the work of Zuckerman et al., who noted higher morbidity in non-operatively managed hip fractures due to prolonged recumbency [18]. Surgical patients, despite facing risks such as implant-related complications, had fewer systemic complications overall [19].

Hospital Stay, Mobilization, and Mortality

Our study found significantly shorter hospital stays and earlier mobilization in surgically managed patients. Early mobilization, as facilitated by surgical fixation, reduces the risk of hospital-acquired complications and promotes faster rehabilitation. This aligns with the study by Bhandari et al., who found that operative treatment reduces length of hospital stay and improves overall patient independence [20]. Although mortality was slightly higher in the conservative group, it was not statistically significant. However, existing literature suggests a trend toward increased mortality with conservative treatment in elderly hip fracture patients [21]. A meta-analysis by Lewis et al. supported this observation and recommended surgical management as the standard of care for stable intertrochanteric fractures in elderly patients [22].

Conclusion

This study demonstrates that surgical management of stable intertrochanteric femur fractures in elderly patients yields superior outcomes in terms of functional recovery, earlier mobilization, and shorter hospital stay when compared to conservative treatment. Although the complication and mortality rates were not statistically significant between the two groups, conservative treatment was associated with a higher incidence of systemic complications such as pressure sores and pulmonary infections due to prolonged immobilization. Surgical fixation should therefore be considered the preferred modality, even in stable fracture patterns, to promote early rehabilitation and preserve functional independence in the elderly population.

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