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To study the functional outcome of trochanteric femoral Nailing for the treatment of Intertrochanteric fractures of femur.

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Abstract

Background: Intertrochanteric fractures of the femur are common injuries, particularly among elderly patients, and are associated with significant morbidity and functional impairment. Trochanteric femoral nailing (TFN) provides stable internal fixation and facilitates early mobilization. The present study was undertaken to evaluate the functional and radiological outcomes of TFN in patients with Intertrochanteric fractures of the femur.

Materials and Methods: This hospital - based prospective study was conducted in the Department of Orthopaedics from November 2022 to June 2024. A total of 100 adult patients with closed Intertrochanteric fractures were included. Patients with sub trochanteric, compound, pathological fractures and fractures in children were excluded. All patients underwent fixation using a trochanteric femoral nail following appropriate fracture reduction and operative planning. Clinical and radiological follow-up was performed at 1, 3 and 6 months. Functional outcome was assessed using the Harris Hip Score, while radiographs were evaluated for fracture union, alignment and complications.

Results: The study included 60 males and 40 females, with a mean age of 59.82 years. The majority of fractures occurred in the 61–70-year age group, and self-fall was the most common mode of injury (78%). Right-sided fractures constituted 58% of cases. According to AO classification, 31A1.3 fractures were most frequent (40%). The mean operative time was 46.70 ± 13.46

minutes and mean estimated blood loss was 88.70 ± 17.95 mL. Fracture union was achieved in all patients, with 54% achieving union at 12–13 weeks, 26% at 10–11 weeks and 20% at 14–15 weeks. Postoperative complications were observed in 36% of patients, the most common being superficial skin infection (12%), followed by hip pain (8%), shortening (8%), thigh pain (4%), persistent limp (2%) and helical blade backout (2%). No non-union or femoral shaft fracture was reported. At final functional assessment, 78% of patients had an excellent Harris Hip Score, 12% had a good score and 10% had a fair outcome, with no patient having a poor functional outcome.

Conclusion: Trochanteric femoral nailing was associated with satisfactory fracture union and favorable functional outcomes in patients with Intertrochanteric femur fractures. The majority of patients achieved excellent or good functional outcomes at follow-up, with a low incidence of major complications. TFN appears to be an effective method of fixation for achieving stable fracture fixation and good functional recovery.

Keywords: Intertrochanteric Fracture, Femur Fracture, Trochanteric Femoral Nail, TFN, Fracture Fixation, Harris Hip Score, Functional Outcome, Fracture Union.

Introduction

Intertrochanteric fractures of the femur are among the most common fractures around the hip and represent a major cause of morbidity, functional dependence and loss of mobility, particularly in the elderly population. The incidence of these fractures is expected to increase with increasing life expectancy and the growing prevalence of osteoporosis. In older individuals, even a low-energy trauma such as a simple fall from standing height may produce an intertrochanteric fracture because of reduced bone mineral density and deterioration of bone quality. These fractures therefore represent not only an orthopaedic problem but also an important public health concern because they are frequently associated with prolonged hospitalization, loss of independence and increased mortality.[1,2]

The Intertrochanteric region extends between the greater and lesser trochanters and consists predominantly of cancellous bone with a rich blood supply. Unlike intra capsular fractures of the femoral neck, Intertrochanteric fractures generally have a favorable biological potential for healing. However, the mechanical environment can be challenging, particularly in unstable and comminuted fractures. The deforming forces generated by the surrounding muscles can produce varus displacement, medialization of the shaft, shortening and rotational instability. Loss of the poster medial or lateral cortical buttress further compromises fracture stability and may predispose to fixation failure.[3,4] Accurate assessment of fracture morphology is therefore essential for selecting the appropriate implant and planning reduction and fixation.

The AO/OTA classification is widely used to describe fracture morphology and facilitates communication regarding fracture stability and treatment.[5,6] Early surgery combined with appropriate perioperative optimization and rehabilitation aims to restore mobility as rapidly and safely as possible.[7,8] Current hip-fracture management recommendations also emphasize early postoperative mobilization and multi-disciplinary rehabilitation to restore mobility and independence.

Several fixation methods have been developed for the treatment of Intertrochanteric fractures. The dynamic hip screw (DHS) has historically been an important extra medullary fixation device, particularly for stable fracture patterns. It permits controlled collapse and impaction at

the fracture site. However, in unstable fractures, excessive collapse, medialization of the shaft, shortening and loss of fixation may occur. These limitations have encouraged the development and increasing use of intramedullary fixation systems, particularly for unstable fracture configurations.[8,9] Comparative evidence has demonstrated advantages of proximal femoral nailing over DHS in selected perioperative parameters, including operative time, blood loss and incision length, although functional outcomes may be comparable in the longer term. Intramedullary devices have biomechanical advantages because the implant is positioned closer to the mechanical axis of the femur, thereby reducing the bending moment acting on the implant. A trochanteric-entry nail also provides a shorter lever arm and can offer improved control of unstable fracture patterns. The intramedullary position of the implant allows load sharing between the nail and the femur and may facilitate early mobilization and weight bearing. These characteristics have made cephalomedullary and proximal femoral nailing important options in the management of unstable Intertrochanteric fractures.[9,10] The proximal fixation provides support within the femoral head and neck, while the intramedullary nail controls the proximal femoral fragment and limits excessive translation. Appropriate reduction and accurate positioning of the cephalocervical component are critical to prevent mechanical complications such as cut-out, migration and loss of reduction.[10,11]

Although modern implants have improved the mechanical stability of fixation, complications such as cut-out, screw or blade migration, varus collapse, peri-implant fracture, infection and postoperative pain can still occur.[11,12] The success of trochanteric femoral nailing depends not only on the implant but also on appropriate preoperative planning and surgical technique. Assessment of the fracture configuration, femoral anatomy, neck-shaft angle and appropriate nail dimensions is essential. Intraoperative restoration of fracture alignment, accurate identification of the entry point and correct placement of the proximal fixation device are particularly important. Poor reduction or inappropriate implant positioning may increase the risk of mechanical failure. The operative protocol in the present study included preoperative assessment of nail diameter, neck-shaft angle and nail length, followed by closed reduction whenever possible and open reduction when satisfactory closed reduction could not be achieved. Postoperative rehabilitation is another important determinant of outcome.. The Harris Hip Score (HHS) is a commonly used clinical scoring system for evaluating functional outcome after hip-related injuries and procedures. It incorporates important domains such as pain, function, deformity and range of motion and allows patients to be categorized into excellent, good, fair or poor outcomes.[13,14] Studies evaluating Intertrochanteric fractures treated with trochanteric-entry or proximal femoral nails have demonstrated that satisfactory radiological union can be accompanied by favorable Harris Hip Scores and progressive recovery of gait and function during follow-up.

Fracture union is another important endpoint of treatment. Although Intertrochanteric fractures usually have good healing potential because of their abundant blood supply, mechanical instability, inadequate reduction, excessive fracture collapse and implant failure may adversely affect healing. Assessment of union on serial radiographs is therefore essential. In the present study, patients were followed clinically and radio

logically at 1, 3 and 6 months. At each visit, hip and knee function, walking ability, deformity, shortening and fracture union were assessed. Radiographic union was defined by bridging of three cortices on anteroposterior and lateral radiographs.

Complications following trochanteric femoral nailing may be classified as early and late. Early complications include postoperative pain, thigh pain and wound or superficial surgical-site infection. Late complications may include limb shortening, persistent limp, blade or screw migration, implant failure, non-union and peri-implant femoral fracture.

Although modern intramedullary nails have reduced several mechanical problems, careful fracture reduction and implant positioning remain essential for minimizing complications.[12,15]

The assessment of these complications is particularly relevant in elderly patients because even relatively minor postoperative problems can delay rehabilitation and adversely affect functional independence.

The increasing use of intramedullary fixation has therefore shifted the focus of treatment from simply achieving fracture union toward achieving rapid and meaningful restoration of function. A successful treatment strategy should provide stable fixation, permit early rehabilitation, minimize complications and allow the patient to return to pre-injury activities as far as possible. Contemporary evidence continues to evaluate differences among various intramedullary nail designs, but overall evidence supports intramedullary fixation as an important treatment option, particularly for unstable fracture patterns.

In view of these considerations, the present prospective study was undertaken to evaluate the functional outcome of trochanteric femoral nailing in the treatment of Intertrochanteric fractures of the femur. The study assessed demographic characteristics, mechanism and side of injury, fracture classification, operative duration, Intraoperative blood loss, duration of hospitalization, time to radiological union, postoperative complications and functional outcome using the Harris Hip Score. Patients were followed for six months with serial clinical and radiological assessments. The study was designed to determine whether trochanteric femoral nailing provides reliable fracture stabilization, satisfactory union and favorable functional recovery in patients with Intertrochanteric fractures.

Materials and Methods

A hospital-based prospective study was conducted in the Department of Orthopaedics from November 2022 to June 2024 after obtaining institutional ethical clearance. A total of 100 patients with Intertrochanteric fractures of the femur were included. Written informed consent was obtained from all participants. Patients underwent clinical and radiological assessment followed by fixation using a trochanteric femoral nail (TFN)**.**

Preoperative evaluation included routine hematological investigations, urine examination, ECG, 2D echocardiography when indicated and radiographs of the pelvis and affected hip. Fractures were classified according to the AO classification. Nail diameter, neck-shaft angle and nail length were assessed preoperatively. Closed reduction was attempted initially, with open reduction performed when satisfactory closed reduction could not be achieved.

Postoperatively, patients received routine monitoring, antibiotics, physiotherapy and progressive mobilization. Static quadriceps exercises were initiated early, followed by active quadriceps and hip-flexion exercises. Partial weight bearing was generally started at approximately

six weeks, with full weight bearing permitted after clinical and radiological evidence of union.

Patients were followed at 1 month, 3 months and 6 months**.** Clinical assessment included hip and knee function, walking ability, deformity, shortening and fracture union. Radiographs were obtained to assess fracture healing. Functional outcome was assessed using the Harris Hip Score (HHS)**.** Bridging of three cortices on anter oposterior and lateral radiographs was considered evidence of union.

Inclusion Criteria

1. Adult and elderly patients with Intertrochanteric fractures of the femur.
2. Closed Intertrochanteric fractures.

Exclusion Criteria

1. Sub trochanteric fractures.
2. Compound/open fractures.
3. Pathological fractures.
4. Fractures occurring in children.

Results

The study included 100 patients, with 60 males and 40 females. The mean age was 59.82 years, with the largest proportion belonging to the 61–70-year age group. Self-fall was the commonest mechanism of injury (78%), followed by fall from height (12%) and road-traffic accidents (10%). Right-sided fractures were slightly more common (58%).

According to AO classification, 31A1.3 fractures were most frequent (40%)**,** followed by 31A1.2 (32%), 31A2.2 (18%) and 31A2.3 (10%).

The mean operative duration was 46.70 ± 13.46 minutes**,** while mean estimated blood loss was 88.70 ± 17.95 mL**.** Fracture union was documented predominantly between 12–13 weeks (54%)**,** followed by 10–11 weeks (26%) and 14–15 weeks (20%).Postoperative complications occurred in 36% of patients, while 64% had no documented complication. Superficial skin infection was the commonest complication (12%), followed by hip pain (8%), shortening (8%), thigh pain (4%), persistent limp (2%) and helical blade back out (2%). No non-union or femoral shaft fracture was reported. At final functional assessment, 78% of patients had an excellent Harris Hip Score, 12% had a good outcome and 10% had a fair outcome; no patient had a poor outcome**.**

Figure 1: Right femur AP view.

Figure 2: Right IT fracture.

Figure 3: Incision site above Greater trochanter.

Figure 4: ZIG placement.

Figure 5: TFN sleeve and guidep in insertion.

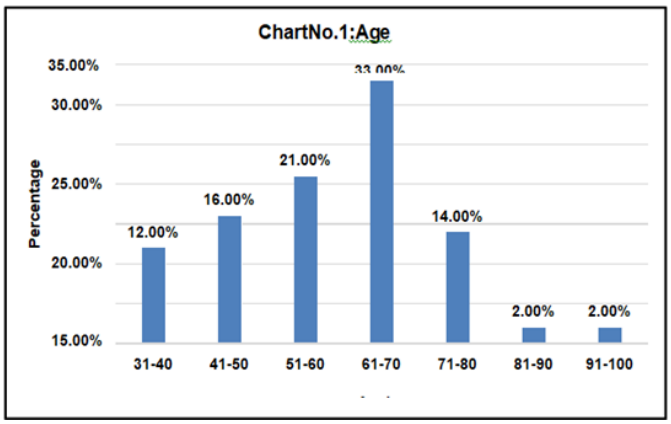
Figure 6: Screw insertion.

Results

Table 1: Age

Age	No. of cases	Percentage
31-40	12	12.0%
41-50	16	16.0%
51-60	21	21.0%
61-70	33	33.0%
71-80	14	14.0%
81-90	2	2.0%
91-100	2	2.0%
Total	100	100%

Chart 1: Age.

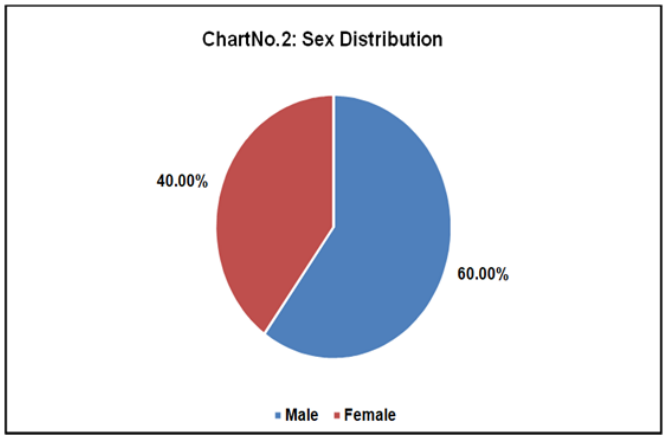


In our series maximum age is 94 years and minimum age 32 years. Most of the patients were between 61 to 70 years. Mean age of 59.82 years

Table 2: Sex Distribution

Sex	No. of cases	Percentage
Male	60	60.0%
Female	40	40.0%
Total	100	100%

Chart 2: Sex Distribution.



In our series, majority of the patients were males 60 (60%) and 40 (40%) female patients.

Table 3: Mode of injury

Mode of injury	No. of cases	Percentage
FFH (Fall from height)	12	12.0%
RTA (Road traffic accident)	10	10.0%
Self fall	78	78.0%
Total	100	100%

The major cause of fracture in our study was self fall, seen in 78 (78%) patients, fall from height were 12 (12%) patients and RTA were 10 (10%) patients.

Table 4: Side of injury

Side of injury	No. of cases	Percentage
Left	42	42.0%
Right	58	58.0%

Table 5: AO classification

AO classification	No. of cases	Percentage
31A1.2	32	32.0%
31A1.3	40	40.0%
31A2.2	18	18.0%
31A2.3	10	10.0%
Total	100	100.0%

We find more cases were displaced Intertrochanteric fractures 31 A1. 3 (40%) common in the present study Significantly we find more 31 A1 .2 fractures when compared to 31 A 2.2 and 31 A 2.3.

Table 6: Duration of surgery (Min)

Duration of surgery (min)	No. of cases	Percentage
<40	48	48.0%
41-50	32	32.0%
51-60	1	14.0%
>90	6	6.0%
Total	10	100.0%

a) Mean duration of operation (Operative time)

	Mean±SD
Mean duration of operation (operative time) (in minutes)	46.70±13.46

The mean time in surgery was 46.70 minutes (<40 minutes).

Table 7: Blood loss (Ml)

Blood loss (ml)	No. of cases	Percentage
<70	22	22.0%
71-80	28	28.0%
81-100	36	36.0%
101-140	14	14.0%
Total	100	100.0%

a) Mean blood loss

	Mean±SD
Mean blood loss (in ml)	88.70±17.95

The mean amount of blood loss in surgery was 88.70 ml (81 - 100ml).

Table 8: Duration of hospital stay

Hospital stay in (Days)	No. of cases	Percentage
7–9	16	16%
10-12	54	54%
13–14	20	20%
15–16	10	10%
Total	50	100.0%

In our series, majority of the patients had hospital stay of 10 – 12 days i. e, 54 (54 %) of cases and 13 -14 days stay was 20 (20 %) patients respectively.

Table 9: Union in weeks

Union in weeks	No. of cases	Percentage
10-11weeks	26	26.0%
12-13weeks	54	54.0%
14-15weeks	20	20.0%
Total	50	100%

Table 10: Post operative complications

Complication	No. of cases	Percentage
Persistent	2	2.0%
Helical blade back out (HBBO)	2	2.0%
Hip pain	8	8.0%
Shortening (SHO)	8	8.0%
Superficial sk in infection (SSI)	12	12.0%
Thigh pain	4	4.0%
Nil	64	64.0%
Total	100	100.0%

Table 11: Early post operative complications.

Complications	No. of	Percentage
Hip pain	8	33%
Thigh pain	4	17%
Superficial Skin Infection	12	50%

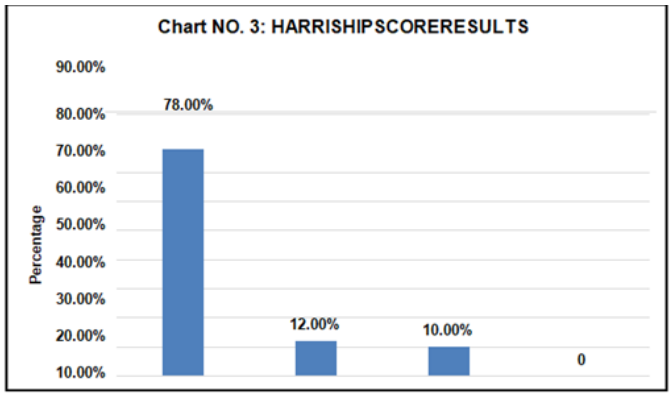
Table 12: Late post operative complications

Complications	No. of	Percentage
Persistent limp	2	16.5%
Shortening (1-2cm)	8	67%
Helical blade back out	2	16.5%
Non - union	0	0
Femoral shaft fractures	0	0

Table 13: Harris hip score results

Results	No. of cases	Percentage
Excellent	78	78.0%
Good	12	12.0%
Fair	10	10.0%
Poor	0	0
Total	100	100%

Chart 3: Harris hip Score Results



The function al outcome according to Harris hip score was graded excellent in 78 %, good in 12 % and fair in 10 % patients and none with poor outcome.

Discussion

Intertrochanteric femoral fractures are predominantly injuries of older adults and are strongly associated with osteoporosis. Increasing life expectancy is expected to increase the overall burden of these fractures. Their consequences extend beyond the fracture itself because pain, prolonged immobility and loss of independence can substantially affect the patient's quality of life and survival.[1,3] Recent reviews similarly describe Intertrochanteric fractures as a major osteoporotic fracture with important effects on mobility, independence and mortality. [1,2]

Demographic Characteristics

In the present study, the mean age was 59.82 years, with the largest proportion of patients in the 61–70-year age group. This predominance of older patients is consistent with the established epidemiology of Intertrochanteric fractures. Osteoporosis and age-related deterioration in bone quality increase susceptibility to low-energy trauma, particularly falls from standing height.[1,3,4] Epidemiological studies have demonstrated a marked increase in proximal femoral fracture incidence with advancing age.

The present study showed a male predominance, with 60% males and 40% females. Although many epidemiological studies demonstrate a higher incidence among elderly women because of postmenopausal osteoporosis, sex distribution can vary according to the population studied, referral patterns and local trauma mechanisms. Therefore, the male predominance observed in the present series should be interpreted in the context of the study population rather than considered a universal epidemiological pattern.

Mechanism of Injury

Self-fall was the commonest mechanism in the present study, accounting for 78% of cases. This finding emphasizes the importance of low-energy trauma in the causation of Intertrochanteric fractures in older individuals. Studies of elderly Intertrochanteric fracture populations similarly identify falls as the dominant mechanism. [3,4]

The predominance of self-fall also highlights the importance of osteoporosis assessment and fall-prevention strategies following treatment. Successful fracture fixation alone does not eliminate the risk of subsequent fragility fractures; secondary prevention should include assessment and management of bone health and modifiable fall-risk factors. [4]

Fracture Classification

In the present study, 31A1.3 was the most common AO fracture subtype, accounting for 40% of cases. The AO/OTA system remains an important method for describing fracture morphology and estimating stability. Fracture characteristics such as lesser trochanters involvement, posterior cortical comminution, lateral wall integrity and reverse-obliquity patterns can influence reduction difficulty and fixation stability. [5,6]

The importance of fracture morphology has become increasingly recognized because reduction quality is a major determinant of fixation success. Recent research has demonstrated that certain AO/OTA patterns, particularly A3 fractures and selected complex A1/A2 configurations, may be associated with greater difficulty in achieving satisfactory reduction. [6]

Operative Time and Blood Loss

The mean operative time in the present study was 46.70 ± 13.46 minute**s**, with a mean blood loss of 88.70 ± 17.95 mL**.** These findings indicate that TFN fixation can be performed with relatively limited operative exposure and blood loss.

The reduced operative morbidity associated with intramedullary fixation has been reported in comparative studies. Zhang et al. found that proximal femoral nailing was associated with significantly shorter operative time, lower Intraoperative blood loss and a shorter incision compared with dynamic hip screw fixation.[7] Similarly, a meta-analysis comparing PFNA, Gamma nails and DHS demonstrated lower blood loss with PFNA compared with DHS. [8]

The present operative findings are also comparable with clinical series of proximal femoral and trochanteric fixation nails. Gadegone and Sal hale reported satisfactory outcomes with short proximal femoral nailing and emphasized its advantages in terms of operative exposure, blood loss and operating time. [9]

Hospital Stay and Early Mobilization

Early mobilization is one of the major objectives of operative treatment of Intertrochanteric fractures. Prolonged immobilization in elderly patients increases the risk of complications including pressure sores, chest infection, venous thromboembolism, muscle wasting and loss of independence. [2,10]

The present study followed a structured postoperative rehabilitation protocol consisting of early quadriceps exercises, progressive hip exercises and subsequent weight-bearing according to clinical and radiological healing. Such rehabilitation is essential because restoration of function, rather than radiological union alone, represents the ultimate goal of treatment.

Fracture Union

In the present study, the majority of fractures united within 12–13 weeks (54%)**,** while 26% united within 10–11 weeks and 20% within 14–15 weeks. No non-union was documented. This favorable healing pattern is consistent with the generally good biological healing potential of Intertrochanteric fractures when adequate reduction and stable fixation are achieved.

Radiological studies of trochanteric fixation nails have demonstrated satisfactory maintenance of reduction and fracture healing. In a study of 255 patients treated with TFN, five cut-outs and one non-union were reported, while implant migration was generally limited and occurred mainly during the early postoperative period. [11]

A study evaluating trochanteric-entry nailing with reduction and compression also demonstrated favorable radiological and functional outcomes, with serial assessment of fracture collapse, gait and Harris Hip Scores. [12]

Postoperative Complications

In the present series, 64% of patients had no postoperative complication. Superficial skin infection was the commonest complication at 12%, followed by hip pain and shortening at 8% each, thigh pain at 4%, and persistent limp and helical blade back out at 2% each. Importantly, no non-union or femoral shaft fracture was reported.

Complications following intramedullary fixation are influenced by fracture stability, reduction quality, bone quality and implant positioning. Earlier generations of Gamma nails were associated with concern regarding femoral shaft fractures; however, subsequent implant development and improved surgical techniques have substantially reduced this problem. [13]

Gill et al., comparing TFN with sliding hip screw fixation, reported a shorter operative time with TFN and found that TFN was an acceptable treatment option for Intertrochanteric fractures. [14]

Shortening and Blade Migration

Shortening of 1–2 cm occurred in 8% of patients in the present study. Some controlled collapse is expected with sliding cephalocervical fixation, particularly in unstable fracture patterns. However, excessive collapse can result in limb shortening, abductor dysfunction and altered gait.

A prospective comparison of a dynamic screw-plate and Gamma nail demonstrated that shortening occurred more frequently with the extra medullary device, particularly in unstable fractures. [15] Studies of TFN have also shown that a limited degree of blade telescoping may occur without compromising fracture healing. [11]

Functional Outcome

The most important finding of the present study was the favorable functional outcome. At final assessment, 78% of patients achieved an excellent Harris Hip Score, 12% achieved a good outcome and 10% achieved a fair outcome, with no poor outcomes**.**

These findings are consistent with published studies demonstrating favorable functional recovery after intramedullary fixation. In an Indian study of unstable Intertrochanteric fractures treated with PFNA-II,

excellent-to-good Harris Hip Score outcomes were observed in 78% of patients. [16]

Gade gone and Sal hale reported good or excellent outcomes in 90% of patients one year after short proximal femoral nailing. [17] More recent Indian data involving TFNA fixation have similarly reported a high proportion of excellent functional outcomes at follow-up.[18]

The improvement in functional outcome is likely related to stable fixation, restoration of limb alignment, fracture union and progressive rehabilitation. However, functional recovery may also be influenced by age, pre-injury mobility, co morbidities, fracture complexity and postoperative rehabilitation.

Comparison with Dynamic Hip Screw

The choice between extra medullary and intramedullary fixation has historically been debated. DHS remains effective for many stable fracture patterns, but intramedullary nails offer biomechanical and surgical advantages, particularly in unstable fractures. [7,19]

A meta-analysis of randomized and quasi-randomized studies demonstrated reduced operative time, blood loss and incision length with PFN compared with DHS, although some clinical outcomes were similar.[7] Another randomized trial of unstable fractures reported shorter operative time, less blood loss and fewer implant failures with PFNA compared with DHS. [19]

However, the superiority of intramedullary fixation should not be overstated. A randomized study of stable Intertrochanteric fractures found that functional scores at later follow-up could be similar between PFN and DHS. [20] Thus, implant selection should be individualized according to fracture morphology, stability, bone quality and surgeon experience.

Evidence Regarding Different Cephalomedullary Nails

Modern Cephalomedullary nails have evolved considerably. Systematic reviews comparing InterTAN, PFNA and Gamma-type nails have generally demonstrated satisfactory functional outcomes across devices, with some differences in implant-related complications and perioperative parameters.[21] A meta - analysis comparing dual-screw and single - screw Cephalomedullary nails reported lower implant failure and reoperation rates with dual-screw constructs, although the clinical significance of these differences requires consideration. [22]

Recent evidence also suggests that both short and long Cephalomedullary nails can provide satisfactory functional outcomes, with differences more consistently observed in operative time and blood loss than in final functional scores.

The present study demonstrates that trochanteric femoral nailing provides reliable fixation with satisfactory operative parameters, a high rate of fracture union and favorable functional recovery. The excellent-to-good Harris Hip Score in 90% of patients indicates that the procedure can restore useful hip function in the majority of patients by follow-up. These findings are consistent with the broader literature supporting intramedullary fixation as an important treatment option for Intertrochanteric fractures, particularly when stable fixation and early mobilization are desired

Conclusion

Trochanteric femoral nailing (TFN) is an effective and reliable method for the surgical management of Intertrochanteric fractures of the femur. In the present prospective study of 100 patients, TFN provided stable fracture fixation with satisfactory operative parameters

and predictable fracture healing. The majority of fractures united within 12–13 weeks, and no case of non-union or femoral shaft fracture was observed**.** Postoperative complications were generally manageable, with superficial skin infection being the most frequent complication. Importantly**,** 64% of patients had no postoperative complications**.** Functional recovery was favorable, with 78% of patients achieving an excellent Harris Hip Score and a further 12% achieving a good outcome**.** No patient had a poor functional result. Thus, trochanteric femoral nailing provides satisfactory fracture union, stable fixation, acceptable complication rates and excellent-to-good functional outcomes in the majority of patients with Intertrochanteric femoral fractures**.** Appropriate patient selection, accurate fracture reduction, proper implant positioning and structured postoperative rehabilitation are essential for achieving optimal results.

Limitations

The study was conducted at a single tertiary-care centre with a relatively small sample size of 100 patients, limiting the generalizability of the findings. The 6-month follow-up period was relatively short and may not adequately capture long-term functional outcomes or late implant-related complications.

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