

FUNCTIONAL AND RADIOLOGICAL OUTCOME IN INTERTROCHANTERIC FRACTURES OPERATED WITH PROXIMAL FEMORAL COMPRESSION NAILING – A PROSPECTIVE STUDY

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ABSTRACT

Intertrochanteric femoral fractures often result in loss of mobility and independence, especially in the elderly. This prospective observational research set out to evaluate the radiological and functional outcomes of proximal femoral compression nailing (PFCN). PFCN fixation was used to treat 17 patients with intertrochanteric fractures, who were monitored at 6, 12, and 24 weeks following surgery. While fracture healing was assessed using the Radiographic Union Score for Hip (RUSH), functional recovery was assessed using the Harris Hip Score (HHS). Mean HHS increased from 49.41 ± 8.06 at 6 weeks to 67.53 ± 7.22 at 12 weeks and 82.82 ± 9.38 at 24 weeks. The final follow-up results showed that 13 patients (76.5%) had good to excellent functional outcomes. Mean RUSH increased from 10.29 ± 2.69 to 16.82 ± 2.83 and 26.00 ± 2.26 across the respective assessments. Both scores improved statistically significantly over time ($p < 0.001$). By 24 weeks, all patients had achieved the radiographic union threshold that was defined by the study. There was only one reported implant failure. There was no significant correlation between age and sex and outcome scores. PFCN was significantly associated with favourable short-term recovery, though with regulated follow-up, no comparator and a small sample size, this limits the extent to which conclusions can be drawn. More comparative testing should be performed to prove durability.

KEYWORDS: Intertrochanteric Fracture; Proximal Femoral Compression Nail; Harris Hip Score; Radiographic Union; Functional Outcome.

1. INTRODUCTION

Intertrochanteric fractures are the most frequently seen extracapsular lesions of the proximal femur that often have a significant effect on mobility, independence and quality of life, especially in the older. Age-related fragility of the bones, having a poor balance, and other medical conditions make it easier for people to get a fracture after a low-energy fall. These injuries often demand hospitalisation, surgery and extended recuperation, impacting patient, carers and health systems. Modern treatment of hip fracture is focused on proactive clinical assessment, optimising medical treatment, prompt surgery and rehabilitation with the aim of avoiding unnecessary complications and achieving early independence of movement (Griffiths et al., 2021). Therefore, the organization of inpatient treatment and the provision of multidisciplinary resources is an important factor when considering the treatment of older patients with hip fractures (Chang et al., 2022).

The clinical burden is not limited to fracture fixation given that patients are generally under-reserved and often have several comorbidities. For effective management, the perioperative risk, postoperative mobilization and prevention of medical complications that could affect recovery should be considered (Zuelzer et al., 2023). The fluctuations in hip fracture surgical activity have also illustrated the need for the ongoing availability of orthopaedic services during periods of health care delivery disruption (Okike et al., 2022). Individual treatment decisions are made based on evidence-based recommendations, which consider the fracture characteristics, patient health, and recovery goals (O'Connor & Switzer, 2022). There is an increased focus on the proper surgical interventions and on the integrated postoperative management of the older person with hip fracture (Switzer & O'Connor, 2022). In addition to the above, system-wide efforts to improve time to surgery offer a different lens to look at optimizing fracture care (Tewari et al., 2022).

The anatomical and mechanical parameters of the proximal femur are very important for the success of fixation. Its trabecular structure allows forces to be transferred between the head, neck and shaft of the femur, while deterioration of the structure decreases resistance to loading (Shah et al., 2025). Preservation and restoration of the stability of the proximal femur is relevant during fixation of fractures because the calcar femorale is an important source of internal stability and force transmission (Zhou et al., 2024). The morphology of the intertrochanteric fracture, posteromedial comminution and integrity of supporting cortices because of these factors, are important considerations regarding implant selection and their mechanical behaviour following surgery. While intracapsular fractures have unique anatomic and biological characteristics, the non-specific literature on surgical interventions for hip fracture care highlights the need to tailor treatment to the type of fracture (Lewis et al., 2022).

Typically, operative stabilization is done with an extramedullary construct (for example, a dynamic hip screw) or an intramedullary construct (for instance a proximal femoral nail). Comparative evidence reports on the results of these techniques in fixation performance and clinical outcome, and results vary with fracture stability and study characteristics (Xu et al., 2022). There has also been a comparison of proximal femoral nail antirotation with dynamic hip screw fixation (Zhang et al., 2023) in the context of unstable intertrochanteric fractures, for which there is some evidence in the meta-analysis. In the case of stable fracture patterns, dynamic hip screw and proximal femoral nailing are both being clinically compared (Musa et al., 2025). The results emphasize the need to calculate results in the circumstances of specific surgical techniques and not across all fixation devices.

Cephalomedullary nails are intramedullary load-sharing nails, and different proximal fixation methods are designed to prevent rotation and fracture collapse. Proximal femoral nail anti-rotation and InterTAN implants have been compared, and there is interest in the clinical implications of the different implant configurations (Liao et al., 2024). Other factors to consider are nail length, with systematic evidence exploring the outcomes of short and long cephalomedullary nails (Rajnish et al., 2023). Proximal femoral compression nailing uses a lag screw and compression screw for fixation and controlled compression. But the design of the implant doesn't take the place of the need to assess hip function and radiographic healing in the long run.

The Harris hip score, which incorporates pain, functional impairment, gait, motion, and deformity, can be used to assess for functional improvement after surgery. Radiographic Union Score for hip assessment is a numerical evaluation of the amount of healing of the cortex and the trabeculae on serial radiographs. Assessment of both measures at follow-up time points provides complementary data for assessment of the recovery following proximal femoral compression nailing. To evaluate functional outcome with the HHS at 6, 12 and 24 weeks postoperatively.

Objectives:

- To assess functional results using the HHS at 6, 12, and 24 weeks after surgery.
- To evaluate radiological fracture healing using the Radiographic Union Score for Hip at the same intervals.
- To document postoperative complications and examine associations of age and sex with functional and radiological outcomes.

2. MATERIALS AND METHODS

2.1. Study Design and Setting

The study was a prospective observational study carried out in “Mahatma Gandhi Medical College and Research Institute, Pondicherry, India”, from April 2024 to March 2026 in the Department of Orthopaedics. The aim of the study was to assess the functional and radiologic results of proximal femoral compression nailing (PFCN) in the treatment of intertrochanteric fractures of the femur. Functional recovery and radiological fracture healing were evaluated at selected postoperative periods of 6, 12 and 24 weeks.

2.2. Study Population and Sample Size

Patients with a minimum of 17 patients with radiographically confirmed intertrochanteric fractures of the femur who were treated with surgical fixation with PFCN were included in the study. Patients who came to the ED or orthopaedic outpatient department with a suspected hip trauma were assessed clinically and radiologically. The sample size was calculated as this was feasible considering the number of patients that could be enrolled during the study period and the availability of postoperative follow-up. All the enrolled patients were subjected to operative fixation followed by functional and radiological assessment.

2.3. Inclusion and Exclusion Criteria

Patients > 18 years of age with radiographically verified intertrochanteric fracture of the femur were included in the study. All male and female patients who met the eligibility criteria were involved in the study. Patients were omitted if they had any pre-existing hip pathology, such as osteonecrosis or dysplasia, pathological fractures due to metastasis or bone cysts, polytrauma with multiple organ systems involvement, neurological deficits of the lower extremities, or previous surgery on the ipsilateral hip.

2.4. Preoperative Assessment

The patients with suspected intertrochanteric fractures were clinically and radiologically assessed. Standard anteroposterior and lateral pelvis and affected hip views were obtained to make the diagnosis and determine the fracture. After radiological confirmation, patients with the eligibility criteria were selected for surgical fixation using PFCN. The surgical operations were carried out by highly skilled orthopaedists according to standard operating procedures under spinal or general anaesthesia.

2.5. Surgical Technique

A proximal femoral compression nail made of titanium was used for surgical fixation. Patients were positioned in the supine position on a fracture table that was radiolucent and the affected limb was placed in a traction boot; the opposite leg was also placed in lithotomy position to facilitate the intraoperative fluoroscopic imaging. The image intensifier was oriented to get both anteroposterior and lateral views of the proximal femur. Abduction of the upper body of about 10-15° into the contralateral or affected side was made to access the femur medullary canal; otherwise, the affected side was abducted by 10-15°. Closed reduction was performed under fluoroscopic manipulation and satisfactory fracture alignment was confirmed in both the AP and lateral planes.

Following reduction, the proximal portion of the greater trochanter underwent a 5–8 cm skin incision. The greater trochanter was revealed by splitting up the fibers of the gluteus medius and tensor fasciae latae after the skin and subcutis were removed. Using a bone awl and a fluoroscope, the entrance site was created on the greater trochanter's apex. A ball-tipped guidewire was then inserted in the femoral canal, and reaming was performed sequentially with cannulated reamers. The reamer used for this proximal reaming was a 13-mm reamer. The insertion jig had an appropriate diameter proximal femoral compression nail attached and was introduced into the femoral canal using gentle rotational movements with light mallet assistance (when necessary). After satisfactory positioning of nails, a proximal lag screw and a compression screw were placed in the nail with the use of the drill sleeve and guide system. One locking screw was used for distal fixation. The nail and screws were positioned under anteroposterior and lateral fluoroscopy. The surgical wound was properly fixed after which it was well irrigated and closed in layers.

2.6. Postoperative Management and Rehabilitation

Patients were given the appropriate analgesics and antibiotics after surgery. Patients were mobilised early using a walker and were taught knee bending and ankle pump exercises. The postoperative care plan outlined full weight bearing with the walker starting on the first postoperative day. Postoperative days 2 and 5 were used for wound inspection and postoperative day 12 for suture removal. Patients then proceeded with rehabilitation as per their standard post op protocol.

2.7. Follow-Up Assessment

Patients were assessed at 6, 12 and 24 weeks after surgery. The follow-up examinations consisted of pain, functional mobility, neurological status, fracture alignment, and radiological union. Patients' functional recovery was assessed by HHS, and radiological fracture healing was assessed by serial radiographs and the RUSH. The thesis was also based on a final clinical and radiological examination at 9 months.

2.8. Functional Outcome Assessment

Functional results were determined by means of the HHS, which rates hip function in four areas: pain, functional capacity, range of motion, and deformity. The scoring system provides 44 points for pain, 47 points for function, 5 points for range of motion and 4 points for the absence of deformity, with a highest total score of 100. The functional results were divided into four categories: bad (less than 70), fair (between 70 and 79), good (between 80 and 89), and exceptional (more than 90). HHS assessments were performed at 6, 12 and 24 weeks postop to assess time-related changes in hip function and functional recovery.

2.9. Radiological Outcome Assessment

The RUSH was used to assess radiological fracture recovery on serial anteroposterior and lateral radiographs taken six, twelve, and twenty-four weeks following surgery. Four criteria are used by RUSH to grade a fracture's consolidation: cortical bridging, cortical fracture-line disappearance, trabecular consolidation, and trabecular fracture-line disappearance. Each of the four cortices—anterior, posterior, medial, and lateral—was scored between 1 and 3 for cortical bridging and the loss of fracture lines. There were two grading methods used: one for trabecular fracture-line removal and another for trabecular consolidation. Higher scores indicate increasing radiographic healing. The total RUSH score varies from 10 to 30. In the research, radiographic union was defined as having an RUSH score of 18 or above. Serial radiographs were used to radiologically assess the fracture alignment and healing process following the PFCN fixing procedure.

2.10. Outcome Measures

The main outcome measures included functional recovery (Harris Hip Score) and radiological fracture healing (Radiographic Union Score for Hip). The results of both outcomes were evaluated at 6, 12 and 24 weeks after the operation. Secondary outcomes were postoperative complications, time to weight-bearing ambulation, pain control and resumption of pre-injury activities.

2.11. Data Collection and Statistical Analysis

Data from the patients were entered into an electronic spreadsheet using Microsoft Excel, and anonymity was maintained by assigning unique identification numbers. Data collected comprised demographic, operative, postoperative, functional and radiological scores during follow-up. IBM SPSS Statistics version 26.0 was employed for statistical analysis. Continuous variables like HHS and RUSH scores were embodied as mean $\pm$ standard deviation, while categorical variables were denoted as frequencies and percentages. Paired t-tests or appropriate non-parametric tests were performed when comparing initial and follow-up measurements. Linear mixed-effects models with patient-specific random intercepts were applied to analyse differences over time in HHS and RUSH scores; mean differences were reported with 95% confidence intervals and p values. A Kruskal–Wallis test was used to compare differences in outcome scores between age groups and a Mann–Whitney Utest was used to compare differences between male and female patients. Spearman correlation analysis was used to examine associations between age and functional outcomes. A p-value of < 0.05 was considered statistically significant.

2.12. Ethical Considerations

Approval was given by institutional ethics committee before the study was started. All subjects gave written informed consent. To ensure patient confidentiality during the investigation, unique identification codes were provided and the clinical information collected was securely stored. Data management and statistical analyses were conducted anonymously with all patient information.

3. RESULTS

3.1. Demographic Characteristics of the Study Population

Proximal femoral compression nailing (PFCN) was used to treat seventeen patients with intertrochanteric femur fractures, and they were assessed six, twelve, and twenty-four weeks after the procedure. The study population ranged in age from 45 to 85 years, with a mean age of 69.47 ± 11.44 years and a median age of 71 years. The age groups of 70–79 years (41.2%) and 80–89 years (23.5%) had the largest patient percentages. There were seven female patients (41.2%) and ten male patients (58.8%). Table 1 provides a summary of the demographic features.

Table 1. Demographic Characteristics of Patients Undergoing Proximal Femoral Compression Nailing (n = 17)

Characteristic	Value
Age (years), mean $\pm$ SD	69.47 $\pm$ 11.44
Median age (years)	71
Age range (years)	45–85
Age distribution, n (%)	
40–49 years	1 (5.9)
50–59 years	2 (11.8)
60–69 years	3 (17.6)
70–79 years	7 (41.2)
80–89 years	4 (23.5)
Sex distribution, n (%)	
Male	10 (58.8)
Female	7 (41.2)

3.2. Functional Outcomes Following PFCN Fixation

HHS was used to determine functional recovery at 6, 12, 24 weeks after surgery. The mean HHS progressively increased from 49.41 ± 8.06 at 6 weeks to 67.53 ± 7.22 at 12 weeks and 82.82 ± 9.38 at 24 weeks. Median scores were 50.0, 67.0, and 86.0, respectively. These results suggest that hip function has improved over time after surgery. Descriptive data is summarized in Table 2, and changes in the mean HHS are shown in Figure 1.

Table 2. Harris Hip Score at Different Postoperative Follow-Up Intervals

Follow-up interval	n	Mean HHS	SD	Median
6 weeks	17	49.41	8.06	50.0
12 weeks	17	67.53	7.22	67.0
24 weeks	17	82.82	9.38	86.0

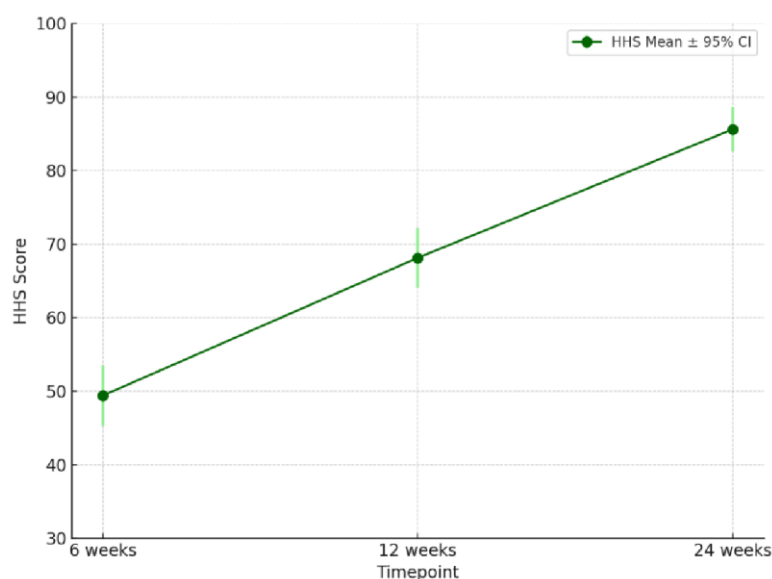


Figure 1. Changes in Mean Harris Hip Score at 6, 12, and 24 Weeks Following Proximal Femoral Compression Nailing

3.3. Distribution of Functional Outcome Categories

Functional outcomes were classified as poor, fair, good or excellent based on the Harris Hip Score. All 17 patients had poor functional outcome at 6 weeks. By 12 weeks, 8 patients remained in the poor group, 6 in the fair group, and 3 in the

good group. At 24 weeks, 11 (64.7%) patients had good functional outcome, 2 (11.8%) had excellent outcome, 2 (11.8%) had fair outcome, and 2 (11.8%) had poor outcome. Overall, 13 of 17 patients (76.5%) had good or excellent functional recovery at 24 weeks. A categorical distribution of HHS is illustrated in Table 3 and is depicted in Figure 2.

Table 3. Distribution of Harris Hip Score Clinical Categories at Different Follow-Up Intervals

HHS category	6 weeks (n)	12 weeks (n)	24 weeks (n)
Poor (<70)	17	8	2
Fair (70–79)	0	6	2
Good (80–89)	0	3	11
Excellent (90–100)	0	0	2
Total	17	17	17

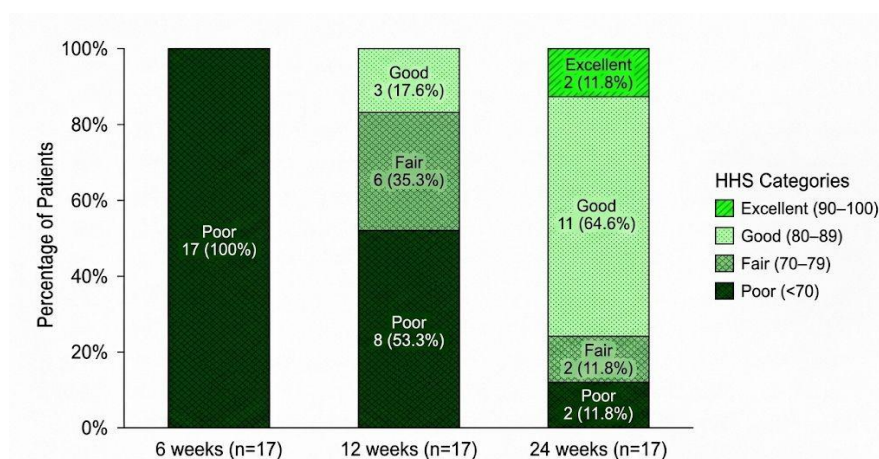


Figure 2. Distribution of Patients According to Harris Hip Score Clinical Categories at 6, 12, and 24 Weeks

3.4. Radiological Outcomes Following PFCN Fixation

Radiological fracture healing was assessed 6, 12 and 24 weeks after surgery with the Radiographic Union Score for Hip (RUSH). The mean RUSH score increased from 10.29 ± 2.69 at 6 weeks to 16.82 ± 2.83 at 12 weeks and 26.00 ± 2.26 at 24 weeks. The median scores were 10.0, 17.0 and 27.0, respectively. An increase in the scores of RUSH was seen in a progressive way and showed the radiological fracture consolidation in the follow-up period. Descriptive radiological findings are shown in Table 4 and changes in the mean RUSH scores are demonstrated in Figure 3.

Table 4. Radiographic Union Score for Hip at Different Postoperative Follow-Up Intervals

Follow-up interval	n	Mean RUSH	SD	Median
6 weeks	17	10.29	2.69	10.0
12 weeks	17	16.82	2.83	17.0
24 weeks	17	26.00	2.26	27.0

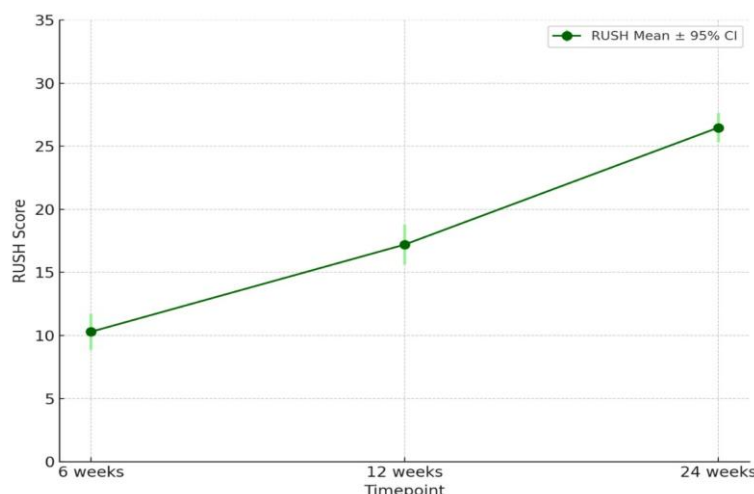


Figure 3. Changes in Mean Radiographic Union Score for Hip at 6, 12, and 24 Weeks Following Proximal Femoral Compression Nailing

3.5. Longitudinal Changes in Functional and Radiological Outcomes

The linear mixed-effects model revealed statistically significant improvements for functional and radiological outcome scores, respectively, in the longitudinal analysis. Compared with the 6-week assessment, the mean HHS increased by 18.12 points at 12 weeks (95% CI: 14.54–21.69; $p < 0.001$) and by 33.41 points at 24 weeks (95% CI: 29.83–36.98; $p < 0.001$). Similarly, the mean RUSH score increased by 6.53 points at 12 weeks (95% CI: 4.99–8.07; $p < 0.001$) and by 15.71 points at 24 weeks (95% CI: 13.85–17.57; $p < 0.001$). These findings showed significant statistically significant improvement over time in terms of functional recovery and radiologic fracture healing. The changes on both measures are summarized in Table 5, and the estimated difference in scores on the RUSH with associated confidence intervals is shown in Figure 4.

Table 5. Longitudinal Changes in Harris Hip Score and Radiographic Union Score for Hip

Outcome measure	Comparison	Mean difference	95% CI	p-value
HHS	6 vs. 12 weeks	+18.12	14.54–21.69	<0.001
HHS	6 vs. 24 weeks	+33.41	29.83–36.98	<0.001
RUSH	6 vs. 12 weeks	+6.53	4.99–8.07	<0.001
RUSH	6 vs. 24 weeks	+15.71	13.85–17.57	<0.001

HHS: Harris Hip Score; RUSH; CI: confidence interval. Estimates were gained using linear mixed-effects models with patient-specific random intercepts.



Figure 4. Mean Changes in Radiographic Union Score for Hip from the 6-Week Baseline to 12 and 24 Weeks, with 95% Confidence Intervals

3.6. Association of Age and Sex with Functional Outcomes

There were no statistically significant alterations in HHS among the age categories at 6 or 24 weeks using the Kruskal–Wallis test ($p = 0.4217$, 0.7642 , respectively). Spearman correlation investigation was also used to determine the correlations between age and HHS at 6 weeks and HHS at 24 weeks, respectively, which were also found to be negligible ($\rho = -0.082$, $p = 0.756$; $\rho = 0.041$, $p = 0.875$). There were no statistically significant changes in HHS between males and females at 6 weeks ($p = 0.0777$), 12 weeks ($p = 0.4826$) and 24 weeks ($p = 0.5631$) after the Mann–Whitney U test. The mean HHS was 84.1 for male and 81.0 for female patients when the patients were at 24 weeks.

3.7. Association of Age and Sex with Radiological Outcomes

At 6 weeks ($p = 0.3157$) and 24 weeks ($p = 0.8610$), there were no statistically significant differences in radiological outcomes across age groups. There were negligible associations between age and RUSH scores at 6 weeks ($\rho = -0.002$, $p = 0.994$) and 24 weeks ($\rho = -0.049$, $p = 0.851$) measured by Spearman correlation analysis. In the same way, the Mann–Whitney U test confirmed that there was no statistically significant difference between the scores of male and female patients at 6 weeks ($p = 0.0849$), 12 weeks ($p = 0.8057$) or 24 weeks ($p = 0.7295$). The average RUSH scores were 26.10 for males and 25.86 for females at 24 weeks.

3.8. Radiographic Union and Implant-Related Complications

All 17 patients (100%) had radiographic union (RUSH score ≥ 18) at 24 weeks. Radiological assessment showed progressive fracture consolidation, along with bridging callus formation; no cases of delayed union or nonunion were reported. 76.5% of the patients (13 patients) had a RUSH score ≥ 25 , and 23.5% (4 patients) had a RUSH score between 18 and 24. The mean tip–apex distance was 18.2 ± 3.1 mm (range 12–24 mm). During the study period, one case of large implant failure was reported.

3.9. Summary of Results

The study showed functional recovery and radiological fracture healing in 17 patients with intertrochanteric femoral fractures because of progressive proximal femoral compression nailing. At 24 weeks, the mean Harris Hip Score improved from 49.41 ± 8.06 at 6 weeks to 82.82 ± 9.38 , and 76.5% of patients had good or excellent functional outcomes. The mean Radiographic Union Score for Hip was 10.29 ± 2.69 and 26.00 ± 2.26 during the same period. The longitudinal analyses revealed statistically significant improvements in both outcome measures ($p < 0.001$). At 24 weeks, all patients had reached radiographic union, and there was no statistically significant association between age, sex, and postoperative functional or radiological scores. There was one major failure of implants reported. Overall, the results of this study showed that the function of the hip was improved, and radiological fracture consolidation was observed over a 24-week postoperative follow-up period.

4. DISCUSSION

The present prospective study aimed to assess functional recovery and radiological healing after proximal femoral compression nailing (PFCN) in patients with intertrochanteric fractures of the femur ($n=17$). Harris Hip Score (HHS) improved from 6 weeks (49.41) to 24 weeks (82.82) and Radiographic Union Score for Hip (RUSH) improved from 6 weeks (10.29) to 24 weeks (26.00). Both measures showed significant improvement over time. These observations indicate short-term recovery in this group is favorable, but cannot prove that PFCN is superior to other fixation methods since no other control groups have been utilized.

There was significant functional improvement, with 13 patients (76.5%) improving to good/excellent HHS categories by 24 weeks versus none at 6 weeks. Recovery probably has more to do with postoperative mobilization, surgical stabilization and the healing of the fracture than with the design of the implant. Functional recovery following intramedullary fixation and dynamic hip screw has been compared with one another, with particular attention paid to the importance of rehabilitation pathways and the role of postoperative evaluations (Backman et al., 2025). Comparisons of proximal femoral nailing and dynamic hip screws are useful to consider when assessing changes in hip function in the current study, though without directly comparing their implants with the current PFCN construct (Prakash et al., 2022).

There was radiological progression alongside functional improvement, and all 17 patients achieved the study-defined RUSH endpoint of ≥ 18 by 24 weeks. The overall trend of mean RUSH scores is increasing, indicating progressive progression of fracture consolidation over scheduled scores. RUSH offers a protocolized method to evaluate radiographic healing, and studies on interobserver reliability support the importance of using RUSH to evaluate fracture union over time (Zhou et al., 2024). When comparing proximal femoral nail systems, radiographic outcomes and clinical recovery should be considered together, as this has been done in some studies (Yalın et al., 2023). However, failing to meet a RUSH threshold is not on its own, proof of mechanical failure or long-term implant durability.

Cephalic screw location and tip-apex distance still have a clinical relevance as they affect the fixation mechanics. Intraoperative distance estimation as evidenced, highlights the significance of consistent radiographic measurement (Al Hussainy et al., 2025). Studies focused directly on double screw constructs also link TAD to cut-out risk (Coviello et al., 2024). Recent studies investigate the relationship between nail geometry and the femoral alignment with the tip-apex distance and the early onset of mechanical failure (Philipp et al., 2026). This small group, however, does not provide any evidence for prediction of outcome from its observed positioning measurements.

A total of 1 major implant failure was reported with radiographic union documented in the entire cohort at 24 weeks. These observations should be correlated with the individual clinical records before a definitive complication profile can be drawn. The results obtained from the comparison of single-screw and dual-screw femoral nailing in a meta-analysis highlight the importance of assessing the device configuration and reoperation risk (Sivakumar et al., 2022). The relevance of implant-specific mechanical outcomes is further highlighted by comparing integrated dual-lag and single-screw cephalomedullary fixation (Box et al., 2026). An analysis of different variants of the Gamma nail also indicates that implant architecture shall be assessed along with clinical outcomes and technical performance (Mariscal et al., 2022).

Comparative data from PFNA vs InterTAN and other intramedullary systems should be used as context only for this PFCN group. For the treatment of unstable fracture, systematical comparison reports: device-dependent clinical considerations (Wang et al., 2023). Assessments of other proximal femur bionic nails and conventional systems also demonstrate differences in fixation techniques and outcomes reported (Mohebbi et al., 2025). Comparative synthesis with PFCN, PFNA and InterTAN provides contemporary evidence on alternative constructs but does not validate the implant studied in this experiment (Cho et al., 2026). Comparisons between intramedullary and extramedullary fixation of unstable fractures also highlight the impact of fracture configuration on treatment comparisons (Protásio et al., 2025). The nail length analysis was yet another reminder that construct selection can impact outcomes regardless of the proximal screw configuration (Zhang et al., 2025).

No statistically significant difference was found between age and functional score or age and radiological score. There was no significant difference between age and functional score, and age and radiological score. While the results were null, this does not show that there is equivalent recovery among the various demographic groups due to the small sample size and uneven age distribution. Other restrictions include the single-centre, observational study design, limited follow-up, no comparator and variability in assessment. Larger prospective comparative cohorts, with uniform reporting of complications and longer follow-up, are required to verify if the observed patterns of recovery hold true and if PFCN is superior to other constructs in patients with various fracture stability patterns.

5. CONCLUSION

In this prospective observational study, the authors showed that progressive functional recovery and radiological fracture healing occurred in 17 patients with intertrochanteric femoral fractures treated with proximal femoral compression nailing.

At 24 weeks, the mean Harris Hip Score improved from 6 to 24 weeks (49.41 to 82.82), and 76.5% of patients had good/excellent functional outcomes. In the same period, the Mean Radiographic Union Score for the hip rose from 10.29 to 26.00. Both measures improved over time, which was statistically significant, and all patients achieved the radiographic union target set by the study by 24 weeks.

A significant association between age and functional or radiological scores was not found, but this could be due to the small number of patients in the study. The mean tip-apex distance was 18.2 mm, and one large implant failure occurred. The observations highlight the significance of proper placement, follow-up care, and clear reporting of complications.

In conclusion, the short-term functional and radiological results in this cohort were good. The single-center design, small sample size, lack of a comparator arm, and relatively short follow-up, however, preclude drawing conclusions about superiority, durability of the treatment, or generalizability. Larger and controlled prospective studies with longer duration of follow-up are warranted to determine clinical effectiveness and implant-related risks in various fracture types and patient groups.

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