



RESEARCH ARTICLE

Functional Outcome of Intertrochanteric Fracture of the Femur Managed by Dynamic Hip Screw versus Proximal Femoral Nail

Alok Kumar Bhagat¹, Abhishek Kumar², Ved Prakash Chandel³, U S Bhagat⁴, M Azam^{5*}

ABSTRACT

Background: Intertrochanteric fractures are common among the elderly and cause severe morbidity. Surgical fixation procedures such as Dynamic Hip Screw (DHS) and Proximal Femoral Nail (PFN) are extensively used. This study compares the functional outcomes.

Methods: This prospective observational study comprised 50 patients with intertrochanteric femur fractures who were treated for a year. Patients were separated into two groups: DHS (n=25) and PFN (n=25). The Harris Hip Score (HHS) was used to assess functional results at 1, 3, and 6 months' intervals. Operative time, blood loss, complications, and union time were all examined.

Results: The PFN group had considerably shorter operational times ($p < 0.05$), lower blood loss ($p < 0.01$), and quicker mobilization ($p < 0.05$). At 6 months, the PFN group had a higher mean HHS (85.2 ± 6.3) than the DHS group (78.4 ± 7.1) ($p = 0.02$). Complication rates were reduced in the PFN group.

Conclusion: When compared to DHS in intertrochanteric fractures, PFN produces better functional outcomes, lower intraoperative morbidity, and speedier rehabilitation.

Keywords: Intraoperative morbidity, speedier rehabilitation, intertrochanteric fractures, PFN, Harris Hip Score (HHS)

Indian J. Pharm. Biol. Res. (2026): <https://doi.org/10.30750/ijpbr.14.1.10>

INTRODUCTION

Intertrochanteric fractures of the femur are among the most common injuries seen in orthopedic practice, especially in the elderly due to osteoporosis and low-energy trauma like falls. These fractures make up a sizable fraction of hip fractures and are associated with high morbidity, mortality, and socioeconomic hardship(1). The major goal of treatment is early mobilization to avoid complications such deep vein thrombosis, pulmonary embolism, pressure sores, and pneumonia. Surgical management remains the standard of care, with internal fixation being the preferred method. Among many fixation devices, the Dynamic Hip Screw (DHS) and Proximal Femoral Nail (PFN) are commonly utilized(2).

DHS is an extramedullary implant that has been regarded as the gold standard for stable intertrochanteric fractures. However, it is associated with a greater surgical exposure, more blood loss, and mechanical disadvantages in unstable fractures(3). PFN, an intramedullary device, provides biomechanical benefits such as a shorter lever arm, less soft tissue damage, and improved load-sharing qualities(4). Despite widespread use, there is debate about the superiority of one implant over the other, particularly in terms of functional outcomes and complications. While PFN is becoming more popular for unstable fractures, DHS is still widely utilized due to its ease and cost effectiveness(5).

¹Senior Resident, Department of Orthopaedics, JLNMCH Bhagalpur, Bihar, India

²Senior Resident, Department of orthopaedics, JLNMCH Bhagalpur, India

³PG, Department of Anatomy, JLNMCH, Bhagalpur, Bihar, India

⁴Unit Head, Department of Orthopaedics, JLNMCH Bhagalpur, Bihar, India

⁵HOD, Department of Orthopaedics, JLNMCH Bhagalpur, Bihar, India

Corresponding Author: M Azam, HOD, Department of Orthopaedics, JLNMCH Bhagalpur, Bihar, India

How to cite this article: Bhagat AK, Kumar A, Chandel VP, Bhagat US, Azam M. Functional Outcome of Intertrochanteric Fracture of the Femur Managed by Dynamic Hip Screw versus Proximal Femoral Nail. Indian J. Pharm. Biol. Res. 2026;14(1):50-53.

Source of support: Nil

Conflict of interest: None.

Received: 20/04/2026 **Revised:** 28/04/2026 **Accepted:** 05/05/2026

Published: 20/05/2026

Using a prospective observational design, this study will compare the functional results, intraoperative parameters, and complication rates of DHS and PFN in patients with intertrochanteric femur fractures(6).

METHODS

- **Study Design:** Prospective observational study
- **Duration:** 1 year
- **Sample Size:** 50 patients
- **Groups:**
 - DHS group (n=25)
 - PFN group (n=25)

Inclusion Criteria

- Age > 18 years
- Intertrochanteric femur fractures
- Fit for surgery

Exclusion Criteria

- Pathological fractures
- Polytrauma patients
- Previous hip surgery

Parameters Studied

- Operative time
- Blood loss
- Time to union
- Harris Hip Score (HHS)
- Complications

Statistical Analysis

Statistical analysis was carried out using the Student's t-test for continuous variables and the Chi-square test for categorical data. Results were presented as mean $\pm$ SD or percentages as applicable. A p-value of <0.05 was judged statistically significant.

RESULTS

Table 1: Demographic Data

Parameter	DHS	PFN	p-value
Mean Age	64.5 $\pm$ 8.2	66.1 $\pm$ 7.9	0.42
Male (%)	60%	56%	0.78

Table 2: Operative Parameters

Parameter	DHS	PFN	p-value
Operative Time (min)	75 $\pm$ 10	60 $\pm$ 8	0.001
Blood Loss (ml)	220 $\pm$ 40	140 $\pm$ 30	0.0005

Table 3: Functional Outcome (HHS)

Time	DHS	PFN	p-value
1 month	55.2	60.4	0.04
3 months	68.3	75.6	0.03
6 months	78.4	85.2	0.02

Table 4: Complications

Complication	DHS	PFN	p-value
Infection	3	1	0.29
Implant failure	2	1	0.55
Shortening	4	1	0.12

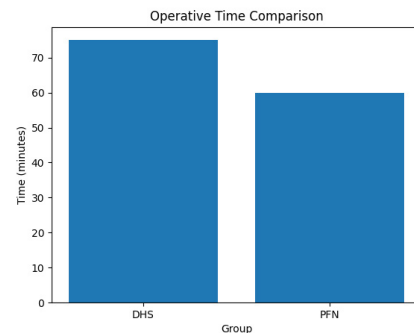


Figure 1: Operative time comparison

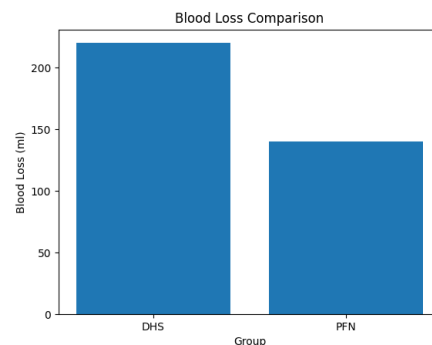


Figure 2: Blood loss comparison

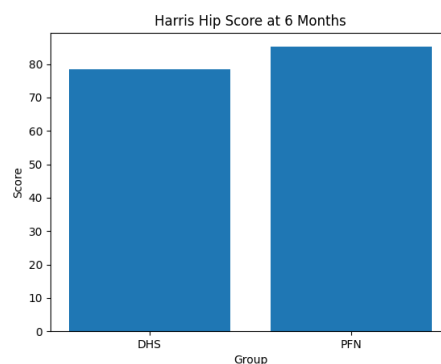


Figure 3: Harris hip score at 6 months

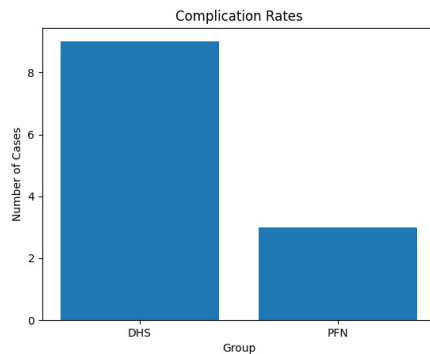


Figure 4: Complication rates

DISCUSSION

Intertrochanteric fractures are a significant challenge, especially in the older population, where early mobilization is critical to reducing morbidity and mortality. This study evaluated the functional and surgical results of DHS and PFN, which revealed significant disparities. Our data show that PFN has a considerable advantage over DHS in terms of operating time and intraoperative blood loss. PFN's reduced surgical exposure and minimally invasive nature contribute to these findings. Previous investigations found that intramedullary implants resulted in shorter surgical times and less soft tissue disturbance(7).

At all follow-up intervals, the PFN group consistently performed better in terms of functional outcomes as measured by the Harris Hip Score. This can be due to faster mobilization and increased biomechanical stability. PFN functions as a load-sharing device and is located closer to the mechanical axis, minimizing stress on the implant and allowing for earlier weight-bearing(8).

The PFN group also had a decreased complication rate, albeit this was not statistically significant across any parameters. DHS is associated with problems including as limb shortening, implant failure, and excessive collapse, especially in unstable fractures. PFN, on the other hand, gives superior control over fracture alignment and minimizes excessive collapse because of its intramedullary location(9).

Despite these benefits, DHS remains a dependable and cost-effective choice, particularly in stable fracture patterns and resource-constrained environments. The technique is straightforward and has a long history of effectiveness(10). However, in unstable fractures, PFN is clearly superior. The limitations of this study include a limited sample size and a brief follow-up period. Long-term functional effects

and implant survival were not evaluated. Additionally, fracture categorization and surgeon expertise may influence results(11).

Overall, this study supports the growing preference for PFN in the treatment of intertrochanteric fractures, particularly those with unstable patterns, because to its biomechanical and functional benefits(12).

CONCLUSION

This prospective study shows that Proximal Femoral Nail is more effective than Dynamic Hip Screw in the treatment of intertrochanteric femur fractures in terms of operating time, blood loss, and functional results. Patients treated with PFN had higher Harris Hip Scores and demonstrated earlier mobilization. Although the PFN group had decreased complication rates, the difference was not statistically significant across any parameters. DHS remains a feasible option, especially in stable fractures and cost-constrained situations.

According to the findings, PFN should be favored, particularly for unstable intertrochanteric fractures, because to its biomechanical benefits and superior clinical outcomes. More studies with larger sample sizes and longer follow-up are needed to corroborate these findings.

REFERENCES

1. Kaushik N, Parvez M, Roshan R, Sabeeb S. A Prospective Comparative Study Examines The Functional Outcome Of Managing Intertrochanteric Fractures Of The Femur Using Dynamic Hip Screw And Proximal Femoral Nail: A Cohort Study. *Student's J Heal Res Africa*. 2024;5(6):1–9.
2. Kumar A, Rao BS, Bhaskar SK. Long term functional outcome of intertrochanteric femur fractures treated with dynamic hip screw v / s proximal femoral nail : Retrospective study. *international J Orthop Sci*. 2018;4(2):672–6.
3. Saeed M, Haq S, Hussain M, Qasim M. Functional outcomes of proximal femoral nail versus dynamic hip screw in intertrochanteric fracture . *Prof Med J*. 2024;31(10):1433–8.
4. Garg P, Dandotiya S, Agarwal A. Functional Outcome of Proximal Femoral Nailing Versus Dynamic Hip Screw in Intertrochanteric Fractures : A Retrospective Cohort Study. *Eur J Cardiovasc Med*. 2023;13(2):563–8.
5. Shukla R, Pathak P, Choyal A. Comparative Analysis of Functional and Radiological Outcome of Proximal Femoral Nail versus Dynamic Hip Screw in Treatment of Intertrochanteric Fractures. *J Orthop Traumatol Rehabil*. 2022;14:24–31.
6. Prakash AK, Nagakumar JS, Shanthappa AH, Venkataraman S, Kamath A. A Comparative Study of Functional Outcome Following Dynamic Hip Screw and Proximal Femoral

- Nailing for Intertrochanteric Fractures of the Femur. *Cureus*. 2022;14(4):1–11.
7. Pushkar D, Chaithanya JS, Raju T. A Study on Functional and Radiological Outcome of Intertrochanteric Fracture Femur Treated with Dynamic Hip Screw or Proximal Femoral Nail. *J Contemp Clin Pract*. 2024;11(6):245–51.
 8. Vilasagarapu Trilok TPR. Functional Outcome of Intertrochanteric Femur Fractures Treated with Proximal Femoral Nail versus Dynamic Hip Screw. *Int J Med Pharm Res*. 2025;6(2):177–83.
 9. Kumar M, Kumar V. Functional outcome of the intertrochanteric fracture of femur managed by Dynamic hip screw and proximal femoral nail : A prospective comparative study. *Indian J Orthop Surg*. 2021;7(4):326–31.
 10. Parikh KN, Parmar C, Patel M, Shah SB. Functional and radiological outcome of proximal femoral nailing versus dynamic hip screw in unstable intertrochanteric femur fractures. *Int J Res Orthop*. 2018;4(6):861–6.
 11. Hemant HK, Yadav PK, Azam M. Functional Outcomes of Intertrochanteric Femur Fractures Treated with Dynamic Hip Screw vs . Proximal Femoral Nail : A Prospective Comparative Study. *Int J Pharm Clin Res*. 2024;16(12):1856–61.
 12. Patel VA, Sheth CB, Bhundiya S. To Compare and Assess Dynamic Hip Screw and Proximal Femur Nail in Intertrochanteric Femur Fracture. *J Res Med Dent Sci*. 2021;9(7):219–24.