

Comparative Outcomes in Patients Undergoing Hemiarthroplasty: Posterior Versus Lateral Approach

Rohit Sharma¹, Madhukar KT², Satyajeet Das³

¹Post Graduate, Department of Orthopaedics, Karwar Institute of Medical Sciences, Karwar Uttara
Kannada District, Karnataka, India

²Professor and HOD, Department of Orthopaedics, Karwar Institute of Medical Sciences, Karwar Uttara
Kannada District, Karnataka, India

³Post Graduate, Department of Orthopaedics, Karwar Institute of Medical Sciences, Karwar Uttara
Kannada District, Karnataka, India

Received: 01-04-2026 / Revised: 25-05-2026 / Accepted: 12-06-2026

Corresponding Author: Dr. Rohit Sharma

Conflict of interest: Nil

Abstract

Background: Fracture neck of femur is a common orthopaedic injury in the elderly population and is associated with significant morbidity, mortality, and reduced quality of life. Because hemiarthroplasty permits early mobilisation and minimises problems associated with extended immobilisation, it is widely recognised as an effective therapy for displaced femoral neck fractures in older patients. The choice of surgical technique is still debatable, though. The posterior and lateral routes are the most often utilised surgical methods. Every strategy has potential benefits and drawbacks that might affect radiological results, functional recovery, and postoperative problems. The goal of the current study was to assess the functional and clinical results of hemiarthroplasty utilising lateral and posterior surgical techniques.

Methods: This comparative observational study included 60 patients with displaced fracture neck of femur who underwent hemiarthroplasty. Patients were divided into two groups based on the surgical approach: posterior approach (Group A, n=30) and lateral approach (Group B, n=30). Demographic characteristics, fracture type, postoperative complications, functional outcomes using Harris Hip Score, and radiological parameters were recorded. Patients were followed at 6 weeks, 3 months, and 6 months postoperatively. Statistical analysis was performed using independent t-test and chi-square test, and a p-value less than 0.05 was considered statistically significant.

Results: The mean age of the study population was 73.3 ± 7.0 years, with female patients comprising the majority (65%). In both groups, garden type IV fractures were more prevalent than type III fractures. Only the posterior approach group experienced hip dislocation (6.7%), whereas the lateral approach group did not experience any dislocation. During the follow-up, both groups' Harris Hip Scores showed steady improvement. The lateral approach group outperformed the posterior approach group in terms of functional results at six months ($p = 0.04$). The lateral approach group's radiological results revealed somewhat improved offset restoration and stem alignment.

Conclusion: Both posterior and lateral approaches provide satisfactory outcomes in hemiarthroplasty. However, the lateral approach may offer advantages in terms of improved hip stability and functional recovery.

Keywords: Hemiarthroplasty, Femoral Neck Fracture, Posterior Approach, Lateral Approach, Harris Hip Score.

DOI: 10.25258/ijcpr.18.6.426

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Fracture neck of femur is one of the most common orthopaedic injuries encountered in elderly patients and represents a major cause of morbidity and mortality worldwide. As the population ages and osteoporosis becomes more common, hip fractures are becoming more common.

Over 1.6 million hip fractures are thought to occur worldwide each year, and this figure is predicted to rise significantly over the next several decades. Significant functional impairment, extended hospital stays, and higher medical expenses are linked to these fractures.[1]

The majority of femoral neck fractures in older people happen after low-energy trauma, including falling from a height. The risk of hip fractures in this population is greatly increased by age-related bone loss, osteoporosis, weakened muscles, and poor balance. Femoral neck fractures are more common in older women because postmenopausal bone loss makes women more susceptible.[2] Orthopaedic surgeons continue to face difficulties in treating misplaced intracapsular femoral neck fractures. Early mobilisation, pain management, hip function restoration, and avoiding consequences from extended immobility are the main objectives of therapy. Because nonoperative therapy is linked to high incidence of complications such as pressure ulcers, pneumonia, and thrombosis, surgical treatment is often favoured over conservative control.[3] For older patients with displaced femur neck fractures, hemiarthroplasty is now a commonly used surgical procedure. Hemiarthroplasty has a number of benefits over internal fixation, including as early weight bearing, a decreased risk of nonunion, and a lower incidence of avascular necrosis.

Additionally, it helps patients restore functional movement more quickly and offers dependable pain relief.[4] The best surgical technique for hemiarthroplasty is still debatable despite its widespread use. Anterolateral, lateral, and posterior approaches to the hip joint have all been documented. The methods that are most often applied in clinical practice are the lateral and posterior approaches. Surgical results may be impacted by specific anatomical considerations and possible problems associated with each method. The posterior technique facilitates femoral preparation and offers superior hip joint vision. Additionally, it keeps the abductor mechanism intact, which is crucial for preserving regular gait mechanics.

However, because this technique disrupts the posterior capsule and short external rotator muscles, it has historically been linked to an increased risk of postoperative dislocation.[5] In order to reach the hip joint, the lateral approach—also referred to as the Hardinge approach—splits the gluteus medius muscle. This method may lower the chance of prosthesis dislocation while preserving the posterior soft tissues. However, muscle splitting may infrequently cause postoperative limp or transient abductor weakness.[6]

The results of hemiarthroplasty utilising various surgical techniques have been compared in a number of research. While some studies have shown similar functional results between the two techniques, others have observed decreased dislocation rates with the lateral approach. The

Harris Hip Score, which gauges pain, function, range of motion, and deformity, is frequently used for functional evaluation after hemiarthroplasty. Assessing implant placement and long-term stability also requires radiological examination, which includes femoral offset correction and stem alignment.[7] The current study was carried out to assess and compare the results of hemiarthroplasty carried out using posterior and lateral methods in patients with displaced femoral neck fractures, given the continuous discussion over the best surgical technique.

Aims and Objectives

Aim: To compare the clinical and functional outcomes in patients undergoing hemiarthroplasty using posterior and lateral surgical approaches.

Objectives

1. To evaluate demographic characteristics of patients undergoing hemiarthroplasty.
2. To compare postoperative complications between posterior and lateral approaches.
3. To assess functional outcomes using Harris Hip Score during follow-up.
4. To evaluate radiological outcomes including stem alignment and femoral offset restoration.
5. To determine the effectiveness of each surgical approach in improving patient outcomes.

Materials and Methods

Study Design: This study was designed as a prospective comparative observational study to evaluate and compare the clinical and functional outcomes of patients undergoing hemiarthroplasty using posterior and lateral surgical approaches.

Study Setting: The study was conducted in the Department of Orthopaedics at a tertiary care teaching hospital Karwar institute of medical sciences, where patients with fracture neck of femur were routinely managed.

Study Duration: The study was carried out over a period of 18 months, during which eligible patients presenting with displaced fracture neck of femur were enrolled and followed up.

Sample Size: A total of 60 patients diagnosed with displaced fracture neck of femur who underwent hemiarthroplasty were included in the study. The patients were divided into two groups based on the surgical approach used: posterior approach (30 patients) and lateral approach (30 patients).

Grouping: Group A – Posterior approach hemiarthroplasty (30 patients) Group B – Lateral approach hemiarthroplasty (30 patients).

Inclusion Criteria

- Patients aged more than 60 years
- Displaced intracapsular fracture neck of femur
- Patients undergoing hemiarthroplasty
- Patients willing to participate in the study

Exclusion Criteria

- Pathological fractures
- Polytraumapatient
- Previous hip surgery
- Patients unfit for surgery

Data Collection

Data collected included:

- Age and gender
- Garden fracture classification

Postoperative complications

- Functional outcome using Harris Hip Score
- Radiological evaluation including stem alignment and offset restoration

Follow-Up

Patients were followed at:

- 6 weeks
- 3 months
- 6 months

Statistical Analysis: Data were analysed using statistical software. Continuous variables were expressed as mean $\pm$ standard deviation, while categorical variables were expressed as percentages.

Independent t-test and chi-square test were used for comparisons. A p-value less than 0.05 was considered statistically significant.

Results

A total of 60 patients with displaced fracture neck of femur who underwent hemiarthroplasty were included in the study. Patients were divided into two groups according to the surgical approach used: Posterior approach (Group A, n=30) and Lateral approach (Group B, n=30).

Demographic characteristics, fracture type distribution, postoperative complications, functional outcomes, and radiological parameters were compared between the two groups.

Table 1: Demographic Characteristics of Patients

P-value	Posterior Approach (n=30)	Lateral Approach (n=30)	Test Statistic	df	P-value	Significance
Mean Age (years)	72.3 $\pm$ 6.5	74.3 $\pm$ 7.5	t = 1.10	58	0.27	Not Significant
Male	13 (43.3%)	8 (26.7%)	$\chi^2 = 1.78$	1	0.18	Not Significant
Female	17 (56.7%)	22 (73.3%)				

Table 1 shows the baseline demographic characteristics of the study population. The mean age of patients in the posterior approach group was 72.3 $\pm$ 6.5 years, while in the lateral approach group it was 74.3 $\pm$ 7.5 years.

The age distribution of the two groups did not differ significantly, according to statistical analysis using the independent t-test (t = 1.10, df = 58, p = 0.27). Because osteoporotic hip fractures are more common in older women, the majority of patients

in both groups were female (56.7% in the posterior approach group and 73.3% in the lateral approach group).

The gender distribution between the two groups, however, did not differ statistically significantly, according to Chi-square analysis ($\chi^2 = 1.78$, df = 1, p = 0.18). The two research cohorts were well matched at baseline, as seen by the general similarity of the demographic data across the groups.

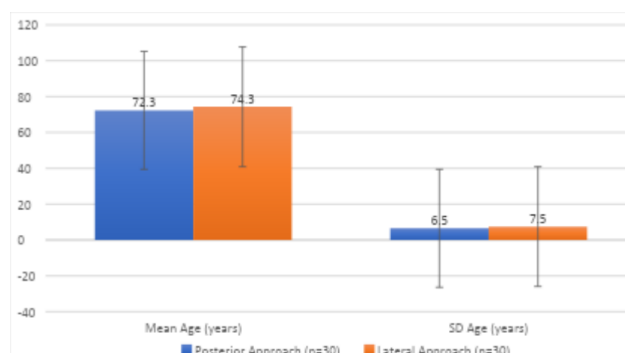


Figure 1A: Mean Age

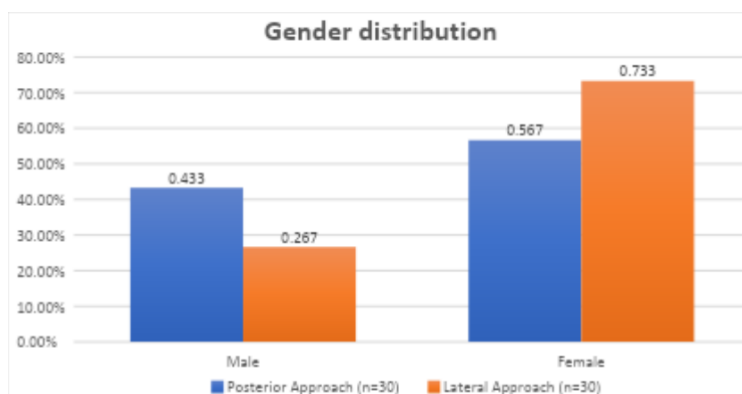


Figure 1B: Gender Distribution

Table 2: Distribution of Fracture Type (Garden Classification)

Garden Type	Posterior Approach (n=30)	Lateral Approach (n=30)	Chi-square	df	p-value	Significance
Type III	14 (46.7%)	11 (36.7%)				
Type IV	16 (53.3%)	19 (63.3%)	$\chi^2 = 0.60$	1	0.43	Not Significant

Table 2 presents the distribution of fracture types according to the Garden classification. Garden type III fractures affected 46.7% of patients in the posterior approach group, whereas Garden type IV fractures affected 53.3% of patients. Similarly, 63.3% of patients in the lateral approach group had type IV fractures and 36.7% of patients had type III fractures. Chi-

square testing showed that the difference in fracture type distribution between the two surgical techniques was not statistically significant ($\chi^2 = 0.60$, $df = 1$, $p = 0.43$), despite the fact that Garden type IV fractures were somewhat more prevalent in both groups. This result implies that the two groups' fracture severity was similar, enabling a fair comparison of surgical results.

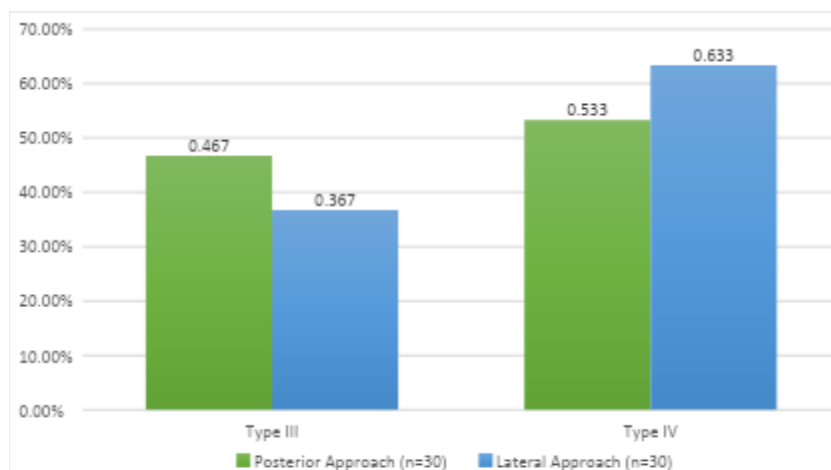


Figure 2: Fracture Type

Table 3: Postoperative Complications

Complication	Posterior Approach (n=30)	Lateral Approach (n=30)	Chi-square	df	p-value	Significance
Hip dislocation	2 (6.7%)	0 (0%)				
Infection	3 (10%)	1 (3.3%)				
No complication	25 (83.3%)	29 (96.7%)	$\chi^2 = 2.13$	2	0.34	Not Significant

Table 3 summarises the postoperative complications observed in both groups. Two patients (6.7%) in the posterior approach group experienced hip dislocation, but there were no reports of dislocation in the lateral approach group. Three patients (10%) in the posterior group and

one patient (3.3%) in the lateral group had postoperative infections. 83.3% of patients in the posterior approach group and 96.7% of participants in the lateral approach group did not have any postoperative problems. Even though the posterior approach group had a slightly higher complication

rate, statistical analysis using the Chi-square test revealed that the difference was not statistically significant ($\chi^2 = 2.13$, $df = 2$, $p = 0.34$). These

results show that, with regard to early postoperative problems, both surgical techniques showed similar safety profiles.

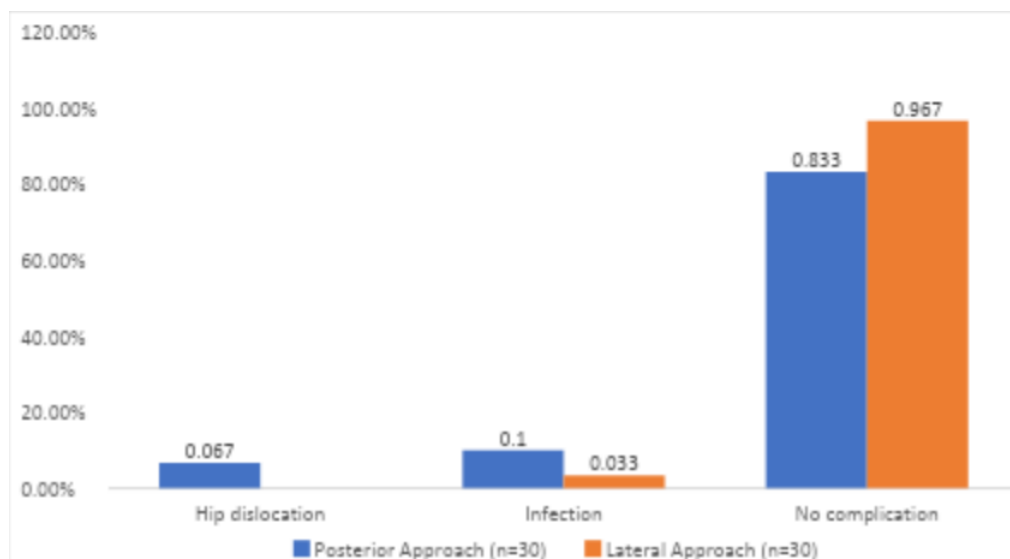


Figure 3: Complications

Table 4: Mean Harris Hip Score at Follow-Up

Follow-up	Posterior Approach (Mean± SD)	Lateral Approach (Mean± SD)	t-Statistic	df	p-value	Significance
6 weeks	55.97± 8.11	55.40± 7.96	0.27	58	0.78	Not Significant
3 months	66.13± 7.76	67.65± 7.27	0.78	58	0.43	Not Significant
6 months	78.6± 7.8	82.1± 6.9	1.83	58	0.04	Significant

Table 4 compares the functional outcomes between the two groups using the Harris Hip Score (HHS) at different follow-up intervals. At 6 weeks, the mean HHS was 55.97 ± 8.11 in the posterior approach group and 55.40 ± 7.96 in the lateral approach group, with no statistically significant difference ($t = 0.27$, $df = 58$, $p = 0.78$). Again, there was no significant difference ($t = 0.78$, $df = 58$, $p = 0.43$) between the lateral group's mean score of 67.65 ± 7.27 and the posterior group's

mean HHS of 66.13 ± 7.76 at the three-month follow-up. At the 6-month follow-up, however, the lateral approach group showed superior functional results, with a mean HHS of 82.1 ± 6.9 as opposed to 78.6 ± 7.8 in the posterior group. This difference was statistically significant ($t = 1.83$, $df = 58$, $p = 0.04$). Overall, hip function improved gradually in both groups over time, with the lateral method showing somewhat better long-term functional results.

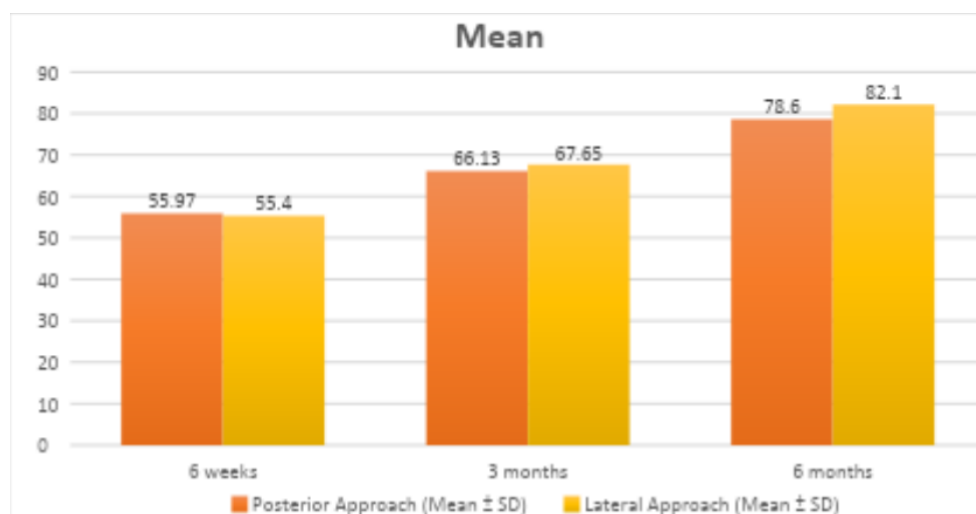


Figure 4: Mean

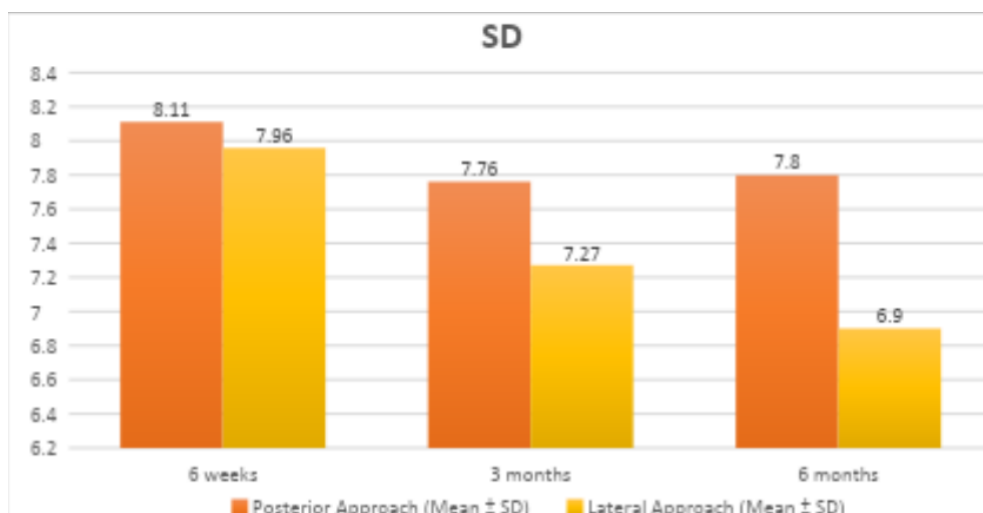


Figure 4: SD

Table 5: Radiological Outcomes

Radiological Parameter	Posterior Approach (n=30)	Lateral Approach (n=30)	Chi-square	df	p-value	Significance
Neutral stem alignment	24 (80%)	27 (90%)				
Varus alignment	4 (13.3%)	2 (6.7%)				
Valgus alignment	2 (6.7%)	1 (3.3%)	$\chi^2 = 1.42$	2	0.49	Not Significant
Adequate offset restoration	23 (76.7%)	26 (86.7%)	$\chi^2 = 1.01$	1	0.31	Not Significant

Table 5 illustrates the radiological outcomes following hemiarthroplasty in both groups. Neutral stem alignment was achieved in 80% of patients in the posterior approach group and 90% in the lateral approach group. 13.3% of patients in the posterior group and 6.7% in the lateral group had varus alignment, whereas 6.7% and 3.3% of patients, respectively, had valgus alignment. 76.7% of patients in the posterior approach group and 86.7% of patients in the lateral approach group

had adequate femoral offset repair. Chi-square analysis revealed that the differences were not statistically significant for offset restoration ($\chi^2 = 1.01$, $df = 1$, $p = 0.31$) or stem alignment ($\chi^2 = 1.42$, $df = 2$, $p = 0.49$), despite the lateral technique showing somewhat superior radiological characteristics. These results imply that both surgical techniques yield similar radiological results, with the lateral approach group showing a tendency toward better alignment.

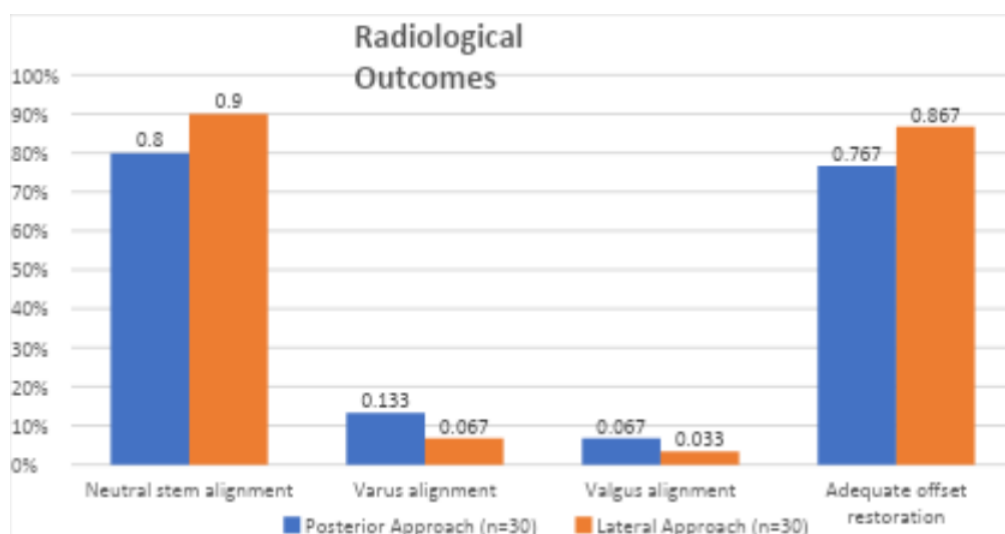


Figure 5: Radiological Outcomes

Discussion

The present study compared clinical, functional, and radiological outcomes of hemiarthroplasty performed through posterior and lateral surgical approaches in patients with displaced fracture neck of femur. In the older population, hip fractures are a leading cause of morbidity and death, especially in postmenopausal women with osteoporosis. For older patients with displaced femur neck fractures, hemiarthroplasty surgical therapy enables early mobility and better functional recovery. However, since each surgical technique has distinct benefits and possible drawbacks, the best strategy is still up for discussion. Bhandari M *et al.* [1]

The average age of the patients in this research was 73.3 ± 7.0 years, and 65% of them were female. This result is in line with earlier epidemiological research showing that osteoporosis and decreased bone mineral density increase the risk of femoral neck fractures in older women. Lewis DP *et al.* reported a similar age and gender pattern, noting that approximately two-thirds of hip fracture cases in patients over 70 were female.[8] The normal demographic pattern of hip fractures documented in orthopaedic literature is also reflected in our findings. Garden type IV fractures were somewhat more prevalent than type III fractures in both groups, according to the distribution of fracture types based on the Garden categorisation. Nevertheless, no statistically significant difference was seen between the groups, indicating that the posterior and lateral approach cohorts had similar fracture severity. Studies by Bhandari M *et al.* have shown a similar distribution of fractures, with displaced Garden III and IV fractures accounting for the bulk of hemiarthroplasty patients.[4] Because fracture severity can have a major impact on postoperative outcomes, it is crucial to ensure similar fracture types across groups. In hemiarthroplasty, postoperative complications continue to be a major issue. Only the posterior approach group (6.7%) experienced hip dislocations in the current research; the lateral approach group did not have any dislocations. Despite not being statistically significant, this difference is consistent with a well-known trend that has been documented in a number of earlier investigations. Due to rupture of the posterior capsule and short external rotators, posterior methods have historically been linked to an increased risk of postoperative dislocation. Similar results were reported by Tsai SW *et al.*, who found that the posterior approach had greater dislocation rates than the anterolateral or lateral methods.[9] Similarly, Enocson A *et al.* found that in hemiarthroplasty patients, the lateral

technique considerably decreased the likelihood of prosthesis dislocation.[5]

Infection and dislocation were among the postoperative complications that were somewhat more common in the posterior approach group in this research. Nonetheless, the majority of patients in both groups had no postoperative problems, suggesting that, when done with the right surgical technique, hemiarthroplasty is often a safe and successful treatment. Low complication rates in hemiarthroplasty operations have also been documented in earlier research, especially when early mobilisation and consistent postoperative rehabilitation regimens are adhered to. Gjertsen JE *et al.*[10]

A key factor in determining surgical success in the treatment of hip fractures is functional result. In this study, both groups' Harris Hip Scores (HHS) gradually improved over the course of the follow-up, demonstrating a successful recovery of hip function. The posterior and lateral methods did not vary statistically significantly at the 6-week and 3-month follow-up. However, the lateral technique showed noticeably improved functional results at the 6-month follow-up ($p = 0.04$). These results are in line with other research that suggests the lateral technique improves hip stability and abductor function. According to Parker MJ *et al.*, patients who had hemiarthroplasty using the lateral method had a somewhat better functional recovery and a decreased chance of instability.[6] Similarly, Rogmark C found that the lateral approach resulted in improved postoperative mobility and reduced dislocation risk compared with the posterior approach.[11]

Although the differences were not statistically significant, radiological assessment in this study revealed that the lateral approach group had somewhat better femoral offset repair and stem alignment. Hip biomechanics and long-term implant stability are significantly impacted by proper implant alignment and femoral offset correction. Early loosening, changed load distribution, and poor functional recovery can all result from misalignment. According to a research by Chammout GK *et al.*, precise femoral offset restoration greatly enhances hip kinematics and patient mobility after hemiarthroplasty.[12] Our results indicate that, with careful surgical skill, both surgical techniques may produce good radiological results.

With similar demographics, fracture patterns, and radiological results, the results of this study therefore support the idea that both posterior and lateral methods are successful for hemiarthroplasty in displaced femoral neck fractures. However, at longer follow-up, the

lateral technique showed a tendency toward reduced dislocation rates and marginally better functional recovery, which might be explained by higher soft tissue stability and posterior structural retention. These results are consistent with current orthopaedic research that suggests the anterolateral or lateral approach to lessen postoperative instability, especially in older patients. Kristensen TB et al.[7]

All things considered, the current study adds to the increasing amount of data comparing surgical techniques for hemiarthroplasty. The lateral approach may have some advantages in terms of hip stability and long-term functional performance, even if both methods produce excellent clinical results.

The best surgical strategy for displaced femoral neck fractures may be further clarified by future multicenter trials with bigger sample numbers and longer follow-up times.

Conclusion

The present study compared outcomes of hemiarthroplasty performed using posterior and lateral surgical approaches in patients with displaced femoral neck fractures. During the follow-up period, both strategies showed good clinical and functional results. The two groups' identical fracture patterns and demographics made it possible to compare surgery results with confidence.

The posterior approach group experienced hip dislocation only, and postoperative problems were somewhat more common in this group. This difference indicates a possible benefit of the lateral method in preserving hip stability, even if it was not statistically significant. During follow-up, both groups' functional results as measured by the Harris Hip Score gradually improved. However, compared to individuals treated with the posterior technique, those treated with the lateral method showed noticeably higher functional scores at the six-month follow-up. The lateral approach group's radiological evaluation revealed somewhat improved femoral offset restoration and stem alignment, albeit these results were not statistically significant. Overall, the findings point to the effectiveness of both surgical techniques for hemiarthroplasty in older patients with femur neck fractures. The lateral technique, however, could offer more functional rehabilitation and hip stability.

Limitations of the Study

1. The study included a small sample size of 60 patients, which may limit the statistical power and generalisability of the findings.

2. Being a single-centre study with a short follow-up period of six months, long-term outcomes and complications such as prosthesis loosening could not be assessed.
3. Variations in surgeon experience and surgical technique may have influenced operative outcomes and postoperative results.

References

1. Veronese N, Maggi S. Epidemiology and social costs of hip fracture. *Injury*. 2018;49(8):1458-1460.
2. Cummings SR, Melton LJ. Epidemiology and outcomes of osteoporotic fractures. *Lancet Diabetes Endocrinol*. 2017;5(5):335-345.
3. Bhandari M, Swiontkowski M. Management of acute hip fracture. *N Engl J Med*. 2017;377(21):2053-2062.
4. Bhandari M, Einhorn TA, Guyatt G, et al. Total hip arthroplasty or hemiarthroplasty for hip fracture. *N Engl J Med*. 2019;381(23):2199-2208.
5. Enocson A, Lapidus LJ, Törnkvist H. Dislocation of hemiarthroplasty after femoral neck fracture: better outcome after the anterolateral approach. *Acta Orthop*. 2018;89(1):16-21.
6. Parker MJ, Gurusamy KS, Azegami S. Arthroplasties (with and without bone cement) for proximal femoral fractures in adults. *Cochrane Database Syst Rev*. 2016;6:CD001706.
7. Kristensen TB, Vinje T, Havelin LI, et al. Posterior versus lateral surgical approach in hemiarthroplasty for femoral neck fractures. *Bone Joint J*. 2020;102-B(3):312-318.
8. Lewis DP, Wæver D, Thorninger R, Donnelly WJ. Hemiarthroplasty vs total hip arthroplasty for displaced femoral neck fractures. *J Arthroplasty*. 2019;34(8):1837-43.
9. Tsai SW, Chen CF, Wu PK, Chen WM. Posterior versus lateral approach in hemiarthroplasty for femoral neck fractures. *BMC Musculoskelet Disord*. 2016;17:1-7.
10. Gjertsen JE, Vinje T, Lie SA, et al. Patient outcomes after hemiarthroplasty for femoral neck fractures. *Acta Orthop*. 2017;88(4):407-14.
11. Rogmark C, Leonardsson O. Hip arthroplasty for femoral neck fractures. *Acta Orthop*. 2016;87(4):402-7.
12. Chammout GK, Mukka SS, Carlsson T, Neander GF, Sköldenberg OG. Total hip replacement versus open reduction in displaced femoral neck fractures. *J Bone Joint Surg Am*. 2019;101(15):1365-74.