

Functional Outcomes of Hip Joint After Primary Cemented Total Hip Replacement for Fracture Neck of Femur

Itsaf Ahmed Shahid, Tafseel Ahmad, Adeel Hamed, Muhammad Zafar Iqbal Shahid, Sadeeq Hamid, Naveed Ali Shair

^{1,2,5}Department of Orthopaedic Surgery, Jinnah Hospital, Lahore; ³Department of Orthopaedic Surgery, Mayo Hospital, Lahore; ⁴Department of Orthopaedic Surgery, Queen's Medical College, Lahore; ⁶Department of Orthopaedic Surgery, Ameer-ud-Din Medical College, Lahore

Corresponding Author: Prof. Muhammad Zafar Iqbal Shahid, Professor of Orthopaedic Surgery, Queen's Medical College, Lahore **Email:** dr.zafar2014@gmail.com

Abstract

Background: Femur neck fractures are serious injuries in elderly people having high morbidity and significant impact on daily living. These are often linked to low energy trauma because of osteoporosis. A lot of surgical options are available to treat these fractures. However Total Hip Arthroplasty (THA) is gaining popularity because of increasing mobility and excellent functional outcomes.

Objective: To evaluate the clinical and functional outcomes of cemented total hip Arthroplasty in elderly people with Intracapsular femoral neck fractures.

Methods: This prospective study was conducted on 30 elderly patients with age in between 60–90 years who presented with displaced intracapsular femur neck fractures. All these patients underwent primary cemented Total Hip Arthroplasty (THA). Each patient was followed for one year, at 3-month intervals. Clinically the pain was assessed by using the Visual Analogue Scale (VAS), and functional status was evaluated by Harris Hip Score (HHS).

Results: Good to excellent outcomes were achieved in the majority of cases by the end of one year at final follow-up. The mean Harris Hip Scores showed significant improvement over time. Postoperative scores typically was 78.02±3.03 by the end of one year. There was also significant reduction in Visual Analogue Score (VAS), dropping from preoperative levels to 2-3 after one year.

Conclusion: Cemented Total Hip Replacement (THR) is an excellent and effective choice for fracture neck of femur in elderly people. The pain relief was excellent and there was significant functional improvement with immediate stability and early weight bearing, making it a superior option in elderly population with intracapsular fracture neck of Femur.

Keywords: Fracture neck of femur, elderly people, visual analogue score, harris hip score, total hip replacement

Received: 23-01-2026

Revision: 17-03-2026

Accepted: 26-04-2026

How to cite: Shahid IA, Ahmad T, Hamed A, Shahid MZI, Hamid S, Shair NA. Functional Outcomes of Hip Joint After Primary Cemented Total Hip Replacement for Fracture Neck of Femur. *Avicenna J Health Sci.* 2026;03(01): 29-33

Introduction

In elderly people, Fracture neck of the femur after trauma is one of the common and debilitating injury in this age group.¹ The incidence of patients having these fractures is about 300,000 each year in elderly people in United States.² The femur neck fractures are the most common type of Hip fractures, making up to 50% of all Hip fractures.³ In elderly people, these fractures are often the result of low-energy trauma such as a simple slip and fall at ground level. With the global increase in life expectancy and as our society is becoming more & more geriatric, the number of patients having these fractures has significantly increased. This poses a considerable major public health concern, with associated morbidity & mortality, in addition to socioeconomic

constraints. This is particularly important in case of displaced fractures of femur neck and shattered bone fragments in the upper part of femur.⁴ The objectives of management with fracture neck of Femur in elderly population is early mobility, restoration of functional status to pre-injury level with overall management & control of postoperative complications.⁵ A lot of surgical options are available to treat these fractures including reconstruction of these fractures, bipolar hemiarthroplasty and Total Hip replacement. Out of these surgical options, Cemented Total Hip Arthroplasty has been accepted as a preferred surgical treatment modality in case of displaced fractures of neck of femur in elderly population with osteoporotic bone and low func-

tional demand.⁶ In Cemented hip arthroplasty, bone cement is used that reduces the chances of implant instability as it secures the prosthesis within the femoral canal. It provides the early weight-bearing, early return to pre-fracture mobility status and rehabilitation.⁷ Moreover, This is particularly important in elderly population, having fracture neck of femur, who are at greater risk of complications related to prolonged immobilization such as deep vein thrombosis, pulmonary problems, joint stiffness and muscle wasting.⁸ Several studies have revealed better pain relief, early mobility, return to pre fracture status and acceptable functional outcomes with cemented prostheses replacement procedure as compared to uncemented Hip replacement.⁹ However, debates continue regarding long-term clinical & functional outcomes, complications related to cement fixation, overall durability of the procedure and the implant in this age group.¹⁰ Although the outcomes vary, based upon the pre-operative health status, age & fracture pattern but still the significant improvement occur in these patients on followup.¹¹

The cemented hip arthroplasty provides valuable insight into the effectiveness of this procedure in restoring mobility, pain relief and independence among old patients having fracture of neck of femur.¹² For assessment of Hip function, Harris Hip Score and Oxford Hip Score, are commonly utilized to assess the postoperative recovery and quality of life.^{13,14} The objectives of this study is to assess the functional outcome of the hip joint after cemented hip arthroplasty in elderly population, presenting with fracture neck of femur as a result of trauma. It also emphasizes its importance in improving mobility, pain relief, restoring the patient pre-injury and overall functional well-being on midterm basis.¹⁵ This study would improve the mode of treatment in developed countries like Pakistan, functional status of old patients who have undergone hip arthroplasty and complication related to the procedure in our geriatric society.

Methods

This Prospective observational cohort study of 30 consecutive patients with acute displaced fracture neck of femur, was conducted at Department of Orthopedic Surgery, Jinnah Hospital, Lahore after approval from the Institutional Review Board of AIMC/Jinnah Hospital, Lahore (Ref No.00181/23)

from January 2023 to June 2024. The sample size (30 patients) was calculated on convenience/pilot cohort basis. All patients with displaced intra capsular fractures of femur neck having age range of 60 to 90 years, were enrolled in the study. The patients having local or systemic infection, impaired cognitive behaviour, associated head & spine injury and who had contraindication due to medical reason, were excluded from the study. After written consent, all these patients were admitted, assessed & screened in terms of functional status and pre-injury mobility. After that, these patients underwent X-Rays of Pelvis with both Hip joints AP View & Lateral View for the affected Hip and fracture pattern was defined according to Garden's classification (Type 1-4). After initial clinical & Radio graphic assessment & fitness for anaesthesia, all these patients were operated with Modified Hardinge approach for primary total hip replacement (THR), 3-7 days after the admission on elective list. Intravenous antibiotics were given within 60 minutes before incision post operatively for 03 days followed by Tab. Nezosolid 600mg twice in a day for further 07 days. We also recorded operative time, estimated blood loss, intra operative complications, and need for transfusion. Early mobilization was encouraged and Patients were asked for weight-bearing as tolerated from post-op day 1. Postoperative anticoagulant therapy was started after one day.

All these patients were followed for a period of one year at 3rd months, 6th months ;9 months and at the end of one year post-operatively for standardized clinical, functional assessment. Moreover, complications during surgery & afterward during the subsequent period of follow-up. We used the Harris Hip Score (HHS) & Visual Analogue Score (VAS) pre operatively & in post-operative follow up to know about pain & functional status of the patients.

Results

Our study included 30 patients with age range of 60-90 years (mean 74+-6.45). Among 30 patients, 19 (63.33%) were having age between 65 to 75 years while remaining 11 patients (26.66%) were above 75 years of age. There were 20 males while 10 patients were females having male to female ratio of 2: 1. Right hip was involved in 22 patients while left sided hip fractures were observed in remaining 08 patients.

We used the Harris Hip Score as assessment tool to assess the function of Hip post-operatively. After 03

months, it was 70.05±3.35 and by the end of 01 year, it was 78.02±3.03. Our primary evaluation indicates that age, gender and anatomical side did not influence the Harris Hip Score significantly 03 months after the surgery. Moreover Harris Hip score improved by the end of first year.

The Harris Hip Score was excellent in 24 patients, good in 03 patients and fair in 02 patients while in 01 patient it was poor. 04 patients developed infection. In 03 patient it resolved with antibiotics and with repeated debridement 06 weeks after the infection while in one patient, it did not resolve. Here the prosthesis was removed and this ended up in poor Harris Score. 03 patients developed DVT on the 3rd postoperative day and it resolved with anticoagulants after 10-12 days of treatment.

Table 1: Patient Demographic Data (N=30)

Variable	Description / Mean ± SD	P-value (vs. 3-month HHS)
Age (Years)	60 - 90 (Range)	> 0.05
Gender (M:F)	20:10 (2:1)	> 0.05
Anatomical Side (L:R)	Right Hip=22, Left Hip=8	> 0.05

Table 2: Clinical Outcomes After Surgery

Assessment Tool	Time Interval	Score (Mean ± SD)	P-value
Harris Hip Score (HHS)	03 Months	70.05±3.35	< 0.05
	01 Year	78.02±3.0378	
Visual Analogue Scale (VAS)	01 Year	2.0- 3.0 (2.3)	<0.05

All data was analyzed by using SPSS Version 21.0. The student t-test was used to assess the results of patient reported outcomes scores. A p-value of less than 0.05 was considered as significant.

Discussion

The femur neck fractures are the most common cause of disability in elderly population.⁵ The Cemented Hip arthroplasty is one of the most commonly performed procedure for intracapsular fracture of neck of Femur. It has got good functional outcomes, better quality of life & rehabilitation is easy. More-over the revision rate of surgery is less. In this age group, cemented Hip arthroplasty is one of the most commonly performed procedure. In this study, we assessed

the functional outcome of 30 elderly patients aged 60 to 90 years who were operated for fracture neck of femur. These patients underwent primary total hip arthroplasty (THA) for these fractures. The Functional status was assessed by using the Harris Hip Score (HHS). This study shows the excellent HHS in 24 patients (80%), good in 2 patients (6.7%), fair in 2 patients (6.7%), and poor in one patient (3.3%). These findings suggest that primary Total Hip Arthroplasty (THA) is an excellent procedure in restoring hip functional status and improved quality of life among elderly patients with intracapsular femoral neck fractures. Only 02 patients in our study had fair results and one with poor results. These outcomes may be attributed to factors such as advanced age, associated comorbidity such as diabetes mellitus, cardiovascular diseases etc; low bone stock and poor rehabilitation protocols. Moreover, peri & post operative complications like infection, deep venous thrombosis, peri prosthetic fractures, prosthetic loosening, although less frequent, may contribute to unfavourable results.

A lot of studies reveal predominance of excellent outcomes that aligns with this procedure which consistently reports superior functional recovery following THA.¹² These studies demonstrate primary THA results in good pain relief and mobility and good functional outcomes due to restoration of both acetabular and femoral components of the hip joint.¹³ In a study conducted by Y.Subash et al; on 45 patients having displaced femur neck fractures with age ranging from 60 to 75 years, had excellent results in 17 patients, good results in 24 patients and fair in 04 patients with no poor result. They came to the conclusion that primary total hip replacement is a good procedure with good functional results.¹⁴

In a prospective study conducted by H.ugrappa which was published in 2024, on 32 elderly patients having neck of femur neck who were treated with cemented total hip arthroplasty. Majority 29 (90.6%) of the patients were having excellent and good functional outcome.¹⁵

A similar study carried by E.M Shehtal et al; at Egypt in 2024 on 18 patients with displaced intracapsular femur neck fractures in elderly people at Zagazig University Hospitals. Each patient was followed for a period of 2 years. The average post-operative Modified Harris Hip Score was 78.7±18.6 which reveals (MHHS) statistically significant improvement in the MHHS score. Most of patients didn't have any postoperative complications, they came to the

conclusion that cemented total hip arthroplasty is an effective technique for management of displaced neck femur fractures in active elderly people.¹⁶ In another study conducted by V.Trivedi in 2025, on 30 elderly patients who presented with displaced intracapsular Femur Neck Fractures. All these patients underwent Total Hip Arthroplasty. Their Harris Hip Score was 88.2 after 06 months of followup.¹⁷ In a prospective study conducted by E.Adhitiyaa on 25 elderly patients, having femur neck fractures who underwent cemented total hip arthroplasty shows good to excellent results in 84% of the patients. The Harris Hip Score was 83.9 after 03 months and was 85.7 at the end of 06 months. They recommended that better hip function can be achieved with primary cemented total hip replacement in elderly patients with femur neck fractures.¹⁸

All these studies in context of existing evidence & the current findings suggest that primary THA is a safe and effective treatment modality for displaced intracapsular fracture of femur neck in active elderly population, especially those with better pre-injury mobility and functional status.¹⁹ However, the procedure demands expert surgical skill and proper patient selection.²⁰

In our study the sample size was relatively small and follow-up was short. Moreover this may not fully explain the survivor-ship of implant on long term basis and its late complications. It requires further research with larger cohorts and extended follow-up to assess the longevity of implant. Moreover patient-reported outcome measures, and cost-effectiveness of implant is also questionable. Furthermore, it was Non-randomized observational design so there is a chance for confounding.

Conclusion

Our study reinforces the role of primary total hip arthroplasty as an effective procedure for fracture neck of femur in the elderly people. Moreover, excellent Harris Hip Score also reveals that, when performed with appropriate patient selection and in expert surgical hands, THR can achieve excellent pain relief, mobility, and improvement in functional status with better quality of life.

Ethical Approval: The Institutional Review Board of AIMC/Jinnah Hospital, Lahore approved this study vide letter No. Ref No.00181/23).

Conflict of Interest / Disclosure: Nil.

Funding Source: Nil.

Authors' Contribution:

IAS: Conception and design; acquisition, drafting of article

TA: Conception & design, analysis and interpretation of data

AH: Drafting of article

MZIS: Drafting of article, critical revisions for important intellectual content, final approval of the version to be published

SH: Analysis and interpretation of data

NAS: Final approval of the version to be published

References

1. Larsen P, Jensen ST, Elsoe R. Femoral neck fracture increases 30-day mortality 16-fold and elevates mortality risk for up to 4 years: a matched cohort study of 3,246 patients. *Eur Geriatr Med.* 2026; 17: 1429-35. Doi: doi.org/10.1007/s41999-026-01449-3.
2. Szymiski D, Walter N, Lang S, Baertl S, Weber J, Alt V, et al. Incidence and treatment of intracapsular femoral neck fractures in Germany. *Arch Orthop Trauma Surg.* 2023;143(5):2529-2537. Doi: 10.1007/s00402-022-04504-3.
3. Gouzoulis MJ, Vasudevan RS, Kaszuba SV, Seddio AE, Rubin LE, Grauer JN, et al. Femoral Neck Fractures: Incidence, Reasons, and Risk Factors of Conversion From Hemiarthroplasty to Total Hip Arthroplasty. *J Am Acad Orthop Surg Glob Res Rev.* 2025;9(5):e24.00312. Doi: 10.5435/JAAOSGlobal-D-24-00312.
4. Zheng X, Xiao C, Xie Z, Liu L, Chen Y. Prediction Models for Prognosis of Femoral Neck-Fracture Patients 6 Months after Total Hip Arthroplasty. *Int J Gen Med.* 2022;15:4339-4356. Doi: 10.2147/IJGM.S347425.
5. Hall T, Baker M, Padkin R. Outcomes of Femoral Neck System Procedures in a Major Trauma Centre. *Cureus.* 2026;18(1):e101113. Doi: 10.7759/cureus.10113.
6. Ahmed HE, Al-Dadah O. Total Hip Arthroplasty in fracture neck of femur: A review of the literature. *Acta Orthop Belg.* 2023;89(1):29-36. Doi: 10.52628/89.1.8497.
7. Rajendra B, Sunita B, Nusrat G. Epidemiological Profile and Risk Factors of Hip Fractures in Elderly Patients: A Retrospective Study. *Int. J of Health Sci and Res* 2026; 16(1): 327-332. Doi: 10.52403/ijhsr.20260137.

8. Bashi AM, Mianehsaz E, Haghpanah B, Tabatabaei SMR, Azadchehr MJ, Kalan Farmanfarma K. Evaluation of the physical function and quality of life of elderly people with femoral neck fracture one year after the injury. *Arch Trauma Res.* 2024;13(4):201-208. Doi: 10.48307/atr.2024.469536.1143.
9. Bhandari M, Devereaux PJ, Tornetta P 3rd, Swiontkowski MF, Berry DJ, Haidukewych G, et al. Operative management of displaced femoral neck fractures in elderly patients. An international survey. *J Bone Joint Surg Am.* 2005;87(9):2122-30. Doi: 10.2106/JBJS.E.00535.
10. Chen XT, Wahlig BD, Kamga LF, Hannon CP, Yuan BJ, Bedard NA. Outcomes of Cemented versus Cementless Total Hip Arthroplasty Following Displaced Femoral Neck Fracture in Patients Under 65 Years of Age. *J Arthroplasty.* 2026;41(3):834-840. Doi: 10.1016/j.arth.2025.07.013.
11. Gasbarra E, Piccirilli E, Greggi C, Trapani F, Iundusi R, Tarantino U. Hip replacement in femoral neck fractures: the role of cementation and its technical difficulties. *Ther Adv Musculoskelet Dis.* 2022; 14:1759720X221144278. Doi: 10.1177/1759720X221144278.
12. Ciatti C, Masoni V, Rivera F, Andriollo L, Bordini B, Quattrini F. Femoral Neck Fracture Management in Elderly Patients: Surgeons' Practice Through a Registry Analysis. *Life.* 2025; 15(10):1503. Doi: <https://doi.org/10.3390/life15101503>
13. Kim HS, Yoo JH, Lee YK, Park JS, Won YY. Treatment of Femoral Neck Fractures in the Elderly: A Survey of the Korean Hip Society Surgeons. *Hip Pelvis.* 2023;35(3):157-163. Doi: 10.5371/hp.2023.35.3.157.
14. Subash Y, B J, RR, Manickam P. The role of primary cemented total hip arthroplasty in the management of fractures of the neck of femur in the elderly population. *Int. J. Res in Orthop.* 2017; 4(1): 814. Doi:<https://doi.org/10.18203/issn.2455-4510.IntJResOrthop20175066e>
15. Ugrappa H, Iqbal R, Hoysala NR, SB, Mruthyunjaya TD. Functional Outcome of Total Hip Replacement in Elderly Patients with Fracture Neck of Femur in a Tertiary Care Hospital. *Int J of Pharm and Clin Res.* 2024; 16(5):403-407.
16. Shehata EM, Soudy ES, ELdesoky MI. Total hip arthroplasty in displaced fracture neck femur in active elderly patients. *Zagazig University Medical Journal.* 2024;30(1.3):215-25.
17. Trivedi V, Samaiya S, Lashkare D. Outcome of total hip arthroplasty in neck of femur fracture in elderly. *Int J Life Sci, Biotech and Pharma Res* 14,(3); 2025 Doi: 10.69605/ijlbpr_14.3.2025.43 248 ©2025Int
18. Adhitiyaa E, Ashok N and Rajkumar B. Functional outcome of primary total HIP arthroplasty in elderly patients with fracture neck of femur: A prospective study. *Int. J. Orthop. Sci.* 2022;8(1):665-671. Doi: 10.22271/ortho.2022.v8.i1i.3084.
19. Rocha AC, Somerville LE, Moody PW, Lanting BA, Howard JL, Naudie DDR, et al. Cementless Versus Cemented Stems in Patients Aged 70 Years or Older Undergoing Total Hip Arthroplasty. *J Arthroplasty.* 2025;40(8S1):S250-S254. Doi: 10.1016/j.arth.2025.02.008.
20. Kumar S, Kumar H, Mittal A, Gupta PK, Singh MK, Kumar R. Prospective Comparative Functional Outcomes of Cemented versus Uncemented Total Hip Replacement in Indian Rural Population. *Journal of Arthroscopy and Joint Surgery.* 2026;13(1):8-13. Doi: 10.4103/jajs.jajs_116_24.



This open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0). To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>