

A Comparative Study of Clinical and Functional Outcomes of Cemented Versus Uncemented Hemiarthroplasty in Patients with Displaced Fractures of the Neck of Femur

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ABSTRACT

Background: Displaced fractures of the neck of the femur are common among elderly individuals and are associated with significant morbidity, functional disability, and reduced quality of life. Hemiarthroplasty is a widely accepted treatment; however, the choice between cemented and uncemented fixation remains debated. **Aim:** To compare the clinical and functional outcomes of cemented versus uncemented hemiarthroplasty in patients with displaced fractures of the neck of the femur. **Materials and Methods:** This prospective comparative observational study included 60 patients with displaced femoral neck fractures, divided into two groups: cemented hemiarthroplasty (n = 30) and uncemented hemiarthroplasty (n = 30). Operative parameters, postoperative pain, mobilization, complications, and functional outcomes using the Harris Hip Score (HHS) were assessed over six months. **Results:** Mean age was comparable between the cemented and uncemented groups (71.8 ± 7.6 versus 70.9 ± 8.2 years). Operative duration (92.6 versus 78.3 minutes; $p < 0.001$) and blood loss (285.4 versus 242.6 mL; $p = 0.009$) were significantly higher in the cemented group. However, cemented hemiarthroplasty demonstrated earlier mobilization (2.4 versus 3.1 days; $p = 0.007$), lower six-month VAS pain scores (0.9 versus 1.5; $p < 0.001$), and higher six-month HHS (86.4 versus 81.2; $p = 0.007$). Periprosthetic fractures and implant subsidence were more frequent in the uncemented group. **Conclusion:** Cemented hemiarthroplasty demonstrated better pain relief, earlier mobilization, and improved functional outcomes, whereas uncemented fixation reduced operative duration and blood loss. Cemented fixation may be preferable in appropriately selected elderly patients.

Keywords: Cemented hemiarthroplasty; Uncemented hemiarthroplasty; Femoral neck fracture; Harris Hip Score; Functional outcomes; Postoperative complications.

INTRODUCTION

Hip fractures represent a major public health concern, particularly among elderly individuals, owing to increasing life expectancy, population ageing, and the rising prevalence of osteoporosis. These fractures are associated with substantial morbidity, mortality, functional disability, and healthcare expenditure. The incidence of hip fractures is expected to increase considerably in the coming decades due to demographic changes. Among these injuries, displaced fractures of the neck of the femur are particularly challenging because of

disruption of the femoral head blood supply, increased risk of nonunion and avascular necrosis, and reduced healing potential in elderly patients. Hemiarthroplasty has therefore become a widely accepted surgical treatment, providing pain relief, mechanical stability, and early postoperative mobilization [1,2].

Despite its established effectiveness, the optimal method of femoral stem fixation remains a subject of clinical debate. Cemented and uncemented hemiarthroplasty are commonly performed, with each technique offering distinct advantages and limitations [3-6]. Cemented

hemiarthroplasty involves fixation of the femoral prosthesis using polymethylmethacrylate bone cement, providing immediate stability and secure fixation, particularly in patients with osteoporotic bone. This technique may reduce postoperative thigh pain, minimize implant micromotion, and facilitate early weight-bearing and functional recovery [7-10]. However, cemented fixation may increase operative duration and carries the risk of bone cement implantation syndrome, which can cause hypotension, hypoxia, cardiac arrhythmias, and cardiovascular collapse, particularly in patients with underlying cardiopulmonary disorders [11,12].

In contrast, uncemented hemiarthroplasty achieves initial stability through press-fit fixation, followed by biological integration of the prosthesis with surrounding bone. This technique avoids cement-related complications and may reduce operative time [13]. Nevertheless, inadequate bone quality in elderly patients may increase the risk of intraoperative fractures, implant subsidence, postoperative periprosthetic fractures, and reduced prosthetic stability [14].

Previous randomized controlled trials and systematic reviews have compared the clinical effectiveness of these techniques. Evidence suggests that cemented hemiarthroplasty may provide better early functional outcomes, reduced postoperative pain, and fewer implant-related complications, although differences in mortality and overall adverse events remain less consistent [13]. Clinical guidelines generally recommend cemented femoral stems for arthroplasty in displaced femoral neck fractures; however, uncemented fixation continues to be used in selected patients [14].

Therefore, the present study, entitled “A Comparative Study of Clinical and Functional Outcomes of Cemented Versus Uncemented Hemiarthroplasty in Patients with Displaced Fractures of the Neck of Femur,” was undertaken to compare postoperative pain, functional recovery, operative parameters, mobilization, and associated complications between the two techniques. The findings may contribute to evidence-based surgical decision-making and optimization of patient outcomes.

MATERIALS AND METHODS

Study Design

The present study was designed as a hospital-based, prospective, comparative observational study to evaluate the clinical and functional outcomes of cemented versus uncemented hemiarthroplasty in patients with displaced fractures of the neck of the femur. Patients were divided into two groups based on the type of hemiarthroplasty performed.

Study Setting

The study was conducted in the Department of Orthopaedics at a tertiary care teaching hospital. Patients diagnosed with displaced femoral neck fractures who underwent hemiarthroplasty and fulfilled the eligibility criteria were included in the study.

Study Duration

The study was conducted over a period of 18 months, during which eligible patients were enrolled, surgically managed, and followed up to assess postoperative clinical and functional outcomes.

Sample Size

A total of 60 patients with displaced fractures of the neck of the femur were included in the study. The patients were divided into two groups:

- Group A (Cemented Hemiarthroplasty): 30 patients underwent cemented hemiarthroplasty.
- Group B (Uncemented Hemiarthroplasty): 30 patients underwent uncemented hemiarthroplasty.

Sampling Technique

Patients fulfilling the inclusion and exclusion criteria were enrolled using a consecutive sampling technique. The selection of cemented or uncemented hemiarthroplasty was based on the treating surgeon's clinical assessment, bone quality, patient comorbidities, and institutional surgical practices.

Inclusion Criteria

1. Patients aged 60 years and above.
2. Patients diagnosed with displaced intracapsular fractures of the neck of the femur (Garden type III or IV).
3. Patients undergoing primary cemented or uncemented hemiarthroplasty.
4. Patients who were medically fit to undergo surgical intervention.
5. Patients who provided written informed consent for participation in the study.

Exclusion Criteria

1. Patients with undisplaced femoral neck fractures (Garden type I or II).
2. Patients with pathological fractures secondary to malignancy or metabolic bone disorders other than osteoporosis.
3. Patients with previous surgery or pre-existing implants in the affected hip.
4. Patients with associated acetabular fractures or significant pre-existing hip arthritis.
5. Patients with active infection involving the affected hip.

6. Patients with severe neurological or musculoskeletal disorders significantly affecting preoperative mobility.
7. Patients who were unwilling to participate or unable to comply with the follow-up protocol.

Preoperative Evaluation

All enrolled patients underwent a detailed clinical evaluation, including documentation of demographic characteristics, medical history, mechanism of injury, affected side, duration since injury, and associated comorbidities. A comprehensive physical examination was performed to assess the general condition, limb position, neurovascular status, and preoperative mobility.

Radiological evaluation was performed using anteroposterior radiographs of the pelvis with both hips and lateral radiographs of the affected hip. Fractures were classified according to the Garden classification.

Routine preoperative investigations included complete blood count, renal function tests, blood glucose, serum electrolytes, coagulation profile, electrocardiography, and other investigations as clinically indicated. Pre-anaesthetic evaluation was performed, and patients were optimized for surgery.

Surgical Procedure

All surgical procedures were performed under appropriate regional or general anaesthesia using standard aseptic precautions. Patients underwent hemiarthroplasty through the surgical approach routinely practiced by the operating surgeon.

Group A: Cemented Hemiarthroplasty (n = 30)

Patients in Group A underwent cemented hemiarthroplasty. Following exposure of the hip joint, the fractured femoral head was removed, and the femoral canal was prepared using appropriate instruments. The femoral canal was irrigated and dried, and polymethylmethacrylate bone cement was introduced using standard cementing techniques. An appropriately sized femoral prosthesis was inserted and maintained in the desired position until the cement had hardened. The hip joint was reduced, and stability, limb length, and range of motion were assessed before wound closure.

Group B: Uncemented Hemiarthroplasty (n = 30)

Patients in Group B underwent uncemented hemiarthroplasty. Following removal of the fractured femoral head, the femoral canal was prepared using sequential broaching to achieve adequate press-fit fixation. An appropriately sized uncemented femoral stem was inserted without bone cement. Implant stability, limb length, and hip joint movement were assessed after reduction. The wound was closed in layers following satisfactory haemostasis.

Postoperative Management

All patients received standard postoperative care, including analgesics, antibiotics, venous thromboembolism prophylaxis, and physiotherapy according to institutional protocols.

Postoperative radiographs were obtained to evaluate prosthesis position, alignment, and any immediate implant-related complications. Early mobilization was encouraged under physiotherapist supervision according to the patient's general condition, implant stability, and tolerance.

Patients were instructed regarding hip precautions, wound care, and rehabilitation exercises. Weight-bearing was initiated as permitted by the operating surgeon, and progression to independent ambulation was encouraged.

Follow-up Assessment

Patients were evaluated during the immediate postoperative period and at scheduled follow-up visits at 6 weeks, 3 months, and 6 months after surgery.

Clinical examination and functional assessment were performed at each follow-up visit. Postoperative pain, walking ability, hip joint movement, functional independence, and implant-related complications were documented. Radiological evaluation was performed when indicated to assess implant position, subsidence, loosening, or periprosthetic fractures.

Outcome Measures

Primary Outcome Measures

The primary outcome was postoperative functional recovery, assessed using the Harris Hip Score (HHS) at 6 weeks, 3 months, and 6 months.

The Harris Hip Score included assessment of pain, functional ability, deformity, and range of motion. The total score ranged from 0 to 100 and was categorized as follows:

- Excellent: 90–100
- Good: 80–89
- Fair: 70–79
- Poor: Below 70

Secondary Outcome Measures

Secondary outcomes included:

1. Operative duration, recorded in minutes.
2. Intraoperative blood loss, recorded in millilitres.
3. Postoperative pain, assessed using the Visual Analogue Scale (VAS).
4. Time to postoperative mobilization, recorded in days.
5. Duration of hospital stay, recorded in days.
6. Requirement for walking aids during follow-up.
7. Postoperative complications, including surgical site infection, dislocation, periprosthetic

fracture, implant subsidence, and prosthetic loosening.

8. Mortality and requirement for revision surgery during the follow-up period.

Data Collection

Data were collected using a structured case record form. Demographic characteristics, clinical findings, radiological assessments, operative details, postoperative complications, and functional outcomes were recorded for each patient.

All collected information was entered into a Microsoft Excel spreadsheet and checked for completeness and consistency before statistical analysis.

Statistical Analysis

Data were analysed using SPSS 27 statistical software. Continuous variables were expressed as mean $\pm$ standard deviation, while categorical variables were presented as frequencies and percentages.

The Shapiro–Wilk test was used to assess the normality of continuous variables. Comparisons between the cemented and uncemented groups were performed using the independent samples t-test for normally distributed continuous variables and the Mann–Whitney U test for non-normally distributed variables. Categorical variables were compared using the Chi-square test or Fisher's exact test, as SPSS 27.

Changes in functional scores over follow-up were assessed using repeated-measures analysis of variance or SPSS 27 nonparametric alternatives, depending on the distribution of the data. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The present study included a total of 60 patients with displaced fractures of the neck of the femur who underwent hemiarthroplasty. Patients were divided into two groups: the cemented hemiarthroplasty group (n = 30) and the uncemented hemiarthroplasty group (n = 30). Demographic characteristics, intraoperative parameters, postoperative recovery, functional outcomes, and complications were compared between the two groups over a follow-up period of six months.

Table 1. Comparison of Demographic and Baseline Clinical Characteristics Between the Two Groups (N = 60)

Parameter	Cemented (n = 30)	Uncemented (n = 30)	p-value
Age (years), Mean $\pm$ SD	71.8 $\pm$ 7.6	70.9 $\pm$ 8.2	0.661
Age group, n (%)			
60–69 years	11 (36.7)	12 (40.0)	
70–79 years	14 (46.7)	13 (43.3)	
≥ 80 years	5 (16.7)	5 (16.7)	
Sex, n (%)			
Male	13 (43.3)	14 (46.7)	0.793
Female	17 (56.7)	16 (53.3)	
Affected side, n (%)			
Right	16 (53.3)	15 (50.0)	0.796
Left	14 (46.7)	15 (50.0)	
Mode of injury, n (%)			
Trivial fall	25 (83.3)	24 (80.0)	
Road traffic accident	3 (10.0)	4 (13.3)	
Other trauma	2 (6.7)	2 (6.7)	
Garden classification, n (%)			
Type III	18 (60.0)	17 (56.7)	0.793
Type IV	12 (40.0)	13 (43.3)	

As shown in Table 1, the mean age of patients in the cemented group was 71.8 $\pm$ 7.6 years, compared with 70.9 $\pm$ 8.2 years in the uncemented group (p = 0.661). Most patients belonged to the 70–79-year age group in both groups (46.7% and 43.3%, respectively). Females constituted 56.7% of the cemented group and 53.3% of the uncemented group. Right-sided fractures were observed in 53.3% and 50.0% of patients, respectively. Trivial falls were the most common mode of injury, accounting for 83.3% and 80.0% of cases. Garden type III fractures predominated in both groups (60.0% versus 56.7%). No statistically significant differences were observed in the reported baseline characteristics, indicating comparable demographic and clinical profiles between the groups.

Table 2. Comparison of Intraoperative Parameters Between Cemented and Uncemented Hemiarthroplasty Groups (N = 60)

Parameter	Cemented (n = 30)	Uncemented (n = 30)	p-value
Operative duration (minutes), Mean $\pm$ SD	92.6 $\pm$ 12.4	78.3 $\pm$ 11.6	<0.001
Intraoperative blood loss (mL), Mean $\pm$ SD	285.4 $\pm$ 65.2	242.6 $\pm$ 58.4	0.009
Blood transfusion, n (%)			
Required	5 (16.7)	4 (13.3)	0.718
Not required	25 (83.3)	26 (86.7)	
Intraoperative complications, n (%)			
Intraoperative femoral fracture	0 (0.0)	3 (10.0)	0.237
Significant hypotension	3 (10.0)	1 (3.3)	0.612
No intraoperative complication	27 (90.0)	26 (86.7)	

Table 2 presents the comparison of intraoperative parameters between the two groups. The mean operative duration was significantly longer in the cemented group (92.6 $\pm$ 12.4 minutes) than in the uncemented group (78.3 $\pm$ 11.6 minutes; $p < 0.001$). Similarly, mean intraoperative blood loss was significantly higher in the cemented group (285.4 $\pm$ 65.2 mL) compared with the uncemented group (242.6 $\pm$ 58.4 mL; $p = 0.009$). Blood transfusion was required in 16.7% of cemented cases and 13.3% of uncemented cases ($p = 0.718$). Intraoperative femoral fractures occurred in three patients (10.0%) in the uncemented group and none in the cemented group ($p = 0.237$). Significant hypotension was observed in 10.0% and 3.3% of patients, respectively ($p = 0.612$). Thus, uncemented hemiarthroplasty was associated with shorter operative duration and lower blood loss, while the reported differences in intraoperative complications were not statistically significant.

Table 3. Comparison of Postoperative Recovery Parameters Between the Two Groups (N = 60)

Parameter	Cemented (n = 30)	Uncemented (n = 30)	p-value
Time to mobilization (days), Mean $\pm$ SD	2.4 $\pm$ 0.8	3.1 $\pm$ 1.1	0.007
Hospital stay (days), Mean $\pm$ SD	7.8 $\pm$ 2.1	8.6 $\pm$ 2.4	0.175
VAS pain score at 24 hours	5.2 $\pm$ 1.1	5.5 $\pm$ 1.2	0.317
VAS pain score at 6 weeks	2.8 $\pm$ 0.9	3.5 $\pm$ 1.0	0.006
VAS pain score at 3 months	1.6 $\pm$ 0.7	2.2 $\pm$ 0.8	0.003
VAS pain score at 6 months	0.9 $\pm$ 0.6	1.5 $\pm$ 0.7	<0.001
Ambulatory status at 6 months, n (%)			
Independent walking	21 (70.0)	16 (53.3)	
Walking with support	8 (26.7)	12 (40.0)	
Unable to walk independently	1 (3.3)	2 (6.7)	

As illustrated in Table 3, patients undergoing cemented hemiarthroplasty demonstrated significantly earlier mobilization than those undergoing uncemented hemiarthroplasty (2.4 $\pm$ 0.8 versus 3.1 $\pm$ 1.1 days; $p = 0.007$). The mean duration of hospital stay was 7.8 $\pm$ 2.1 days in the cemented group and 8.6 $\pm$ 2.4 days in the uncemented group, without a statistically significant difference ($p = 0.175$). The mean VAS pain score at 24 hours was comparable between the groups (5.2 $\pm$ 1.1 versus 5.5 $\pm$ 1.2; $p = 0.317$). However, significantly lower pain scores were observed in the cemented group at six weeks (2.8 $\pm$ 0.9 versus 3.5 $\pm$ 1.0; $p = 0.006$), three months (1.6 $\pm$ 0.7 versus 2.2 $\pm$ 0.8; $p = 0.003$), and six months (0.9 $\pm$ 0.6 versus 1.5 $\pm$ 0.7; $p < 0.001$). At six months, independent walking was achieved by 70.0% of patients in the cemented group compared with 53.3% in the uncemented group. Walking with support was required by 26.7% and 40.0% of patients, respectively.

Table 4. Comparison of Functional Outcomes Using Harris Hip Score at Different Follow-up Intervals (N = 60)

Parameter	Cemented (n = 30)	Uncemented (n = 30)	p-value
Harris Hip Score at 6 weeks	65.8 $\pm$ 7.4	61.2 $\pm$ 8.1	0.025
Harris Hip Score at 3 months	78.6 $\pm$ 7.2	73.4 $\pm$ 7.8	0.009
Harris Hip Score at 6 months	86.4 $\pm$ 6.8	81.2 $\pm$ 7.5	0.007
Improvement from 6 weeks to 6 months	20.6 $\pm$ 5.4	20.0 $\pm$ 5.8	0.680

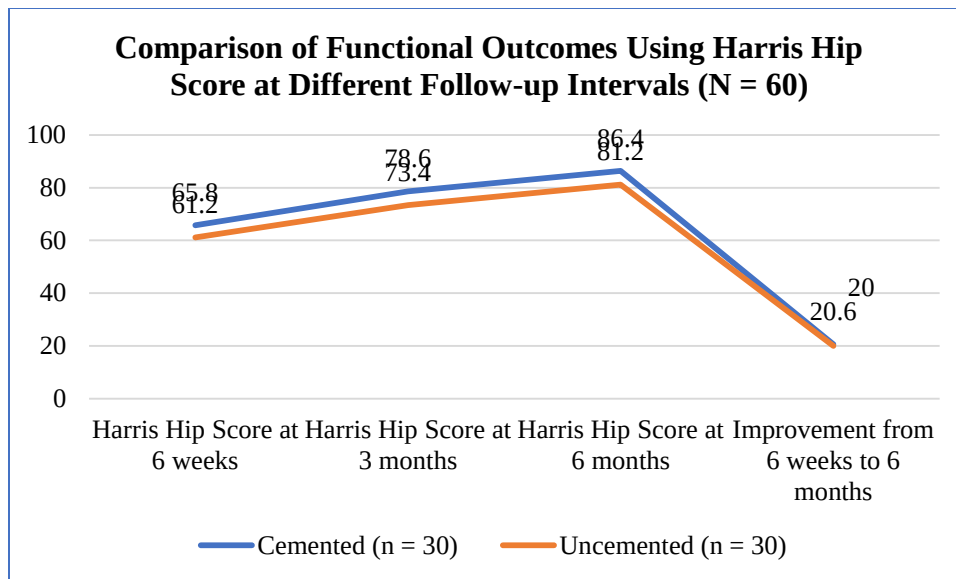


Figure 1 Comparison of Functional Outcomes Using Harris Hip Score at Different Follow-up Intervals (N = 60)

The comparison of Harris Hip Scores at different follow-up intervals is presented in Table 4 and Figure 1. At six weeks, the mean Harris Hip Score was significantly higher in the cemented group than in the uncemented group (65.8 ± 7.4 versus 61.2 ± 8.1 ; $p = 0.025$). This difference persisted at three months (78.6 ± 7.2 versus 73.4 ± 7.8 ; $p = 0.009$) and six months (86.4 ± 6.8 versus 81.2 ± 7.5 ; $p = 0.007$). Both groups demonstrated progressive improvement in functional outcomes during follow-up. The mean improvement in Harris Hip Score from six weeks to six months was 20.6 ± 5.4 in the cemented group and 20.0 ± 5.8 in the uncemented group, with no statistically significant difference ($p = 0.680$). These findings indicated that cemented hemiarthroplasty was associated with higher functional scores throughout follow-up, although the magnitude of improvement over time was comparable between the groups.

Table 5. Comparison of Functional Outcome Categories at 6 Months Between the Two Groups (N = 60)

Functional outcome (Harris Hip Score), n (%)	Cemented (n = 30)	Uncemented (n = 30)
Excellent (90–100)	11 (36.7)	7 (23.3)
Good (80–89)	14 (46.7)	12 (40.0)
Fair (70–79)	4 (13.3)	8 (26.7)
Poor (<70)	1 (3.3)	3 (10.0)
Total	30 (100.0)	30 (100.0)

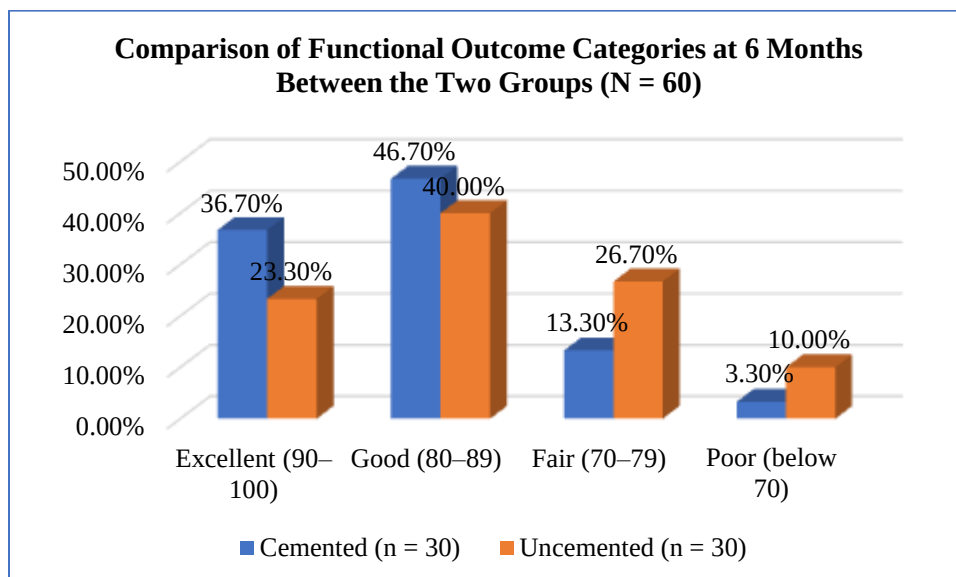


Figure 2 Comparison of Functional Outcome Categories at 6 Months Between the Two Groups (N = 60)

As demonstrated in Table 5 and Figure 2, excellent functional outcomes (Harris Hip Score 90–100) were achieved by 36.7% of patients in the cemented group compared with 23.3% in the uncemented group. Good outcomes were observed in 46.7% and 40.0% of patients, respectively. Overall, excellent-to-good functional outcomes were achieved in 83.3% of cemented cases compared with 63.3% of uncemented cases. Fair outcomes were recorded in 13.3% and 26.7% of patients, while poor outcomes occurred in 3.3% and 10.0%, respectively. These findings demonstrated a more favorable distribution of functional outcome categories in the cemented group at six months, although statistical significance for this categorical comparison was not reported.

Table 6. Comparison of Postoperative Complications Between Cemented and Uncemented Hemiarthroplasty Groups (N = 60)

Complication, n (%)	Cemented (n = 30)	Uncemented (n = 30)
Surgical site infection	2 (6.7)	2 (6.7)
Hip dislocation	1 (3.3)	1 (3.3)
Periprosthetic fracture	0 (0.0)	3 (10.0)
Implant subsidence	0 (0.0)	3 (10.0)
Prosthetic loosening	0 (0.0)	1 (3.3)
Deep vein thrombosis	1 (3.3)	1 (3.3)
Revision surgery	0 (0.0)	2 (6.7)
Mortality during follow-up	1 (3.3)	1 (3.3)

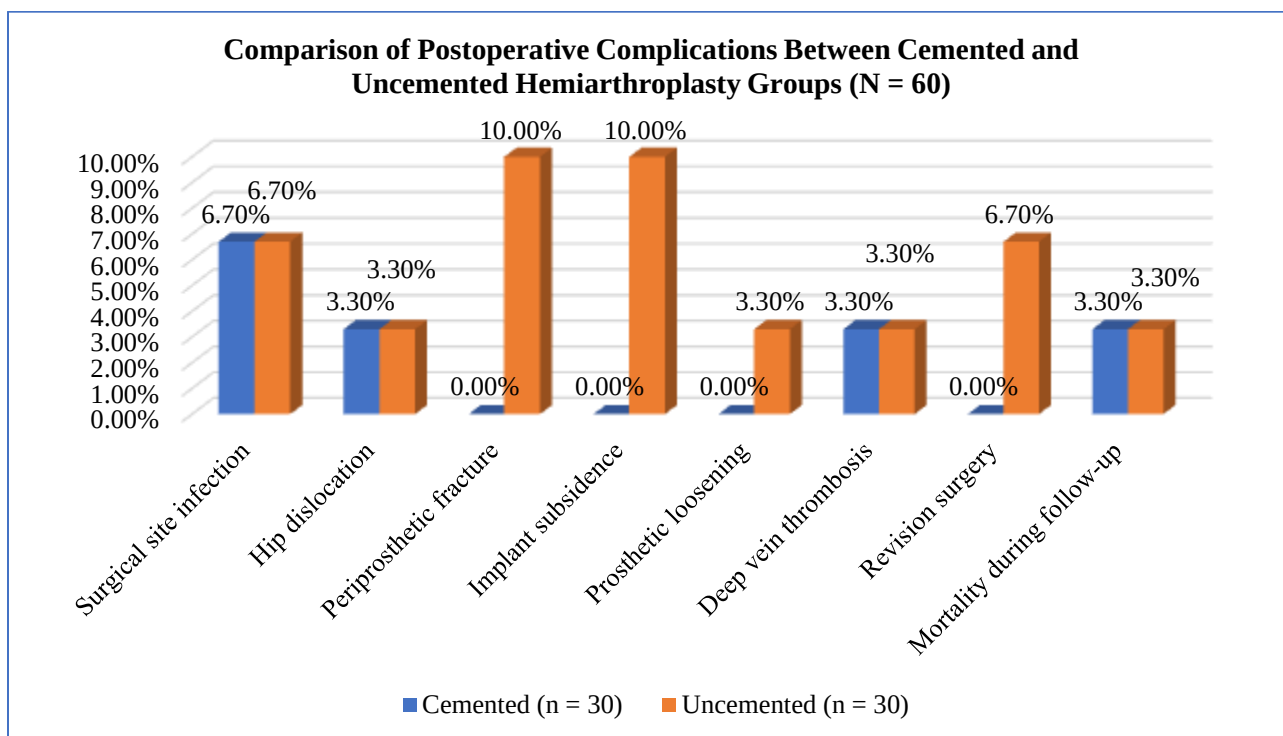


Figure 3 Comparison of Postoperative Complications Between Cemented and Uncemented Hemiarthroplasty Groups (N = 60)

The distribution of postoperative complications is presented in Table 6 and Figure 3. Surgical site infection occurred in two patients (6.7%) in each group, while hip dislocation and deep vein thrombosis were each observed in one patient (3.3%) per group. Periprosthetic fractures and implant subsidence were reported in three patients (10.0%) each in the uncemented group, whereas no such complications were recorded in the cemented group. Prosthetic loosening occurred in one patient (3.3%) in the uncemented group, and revision surgery was required in two patients (6.7%) in this group compared with none in the cemented group. Mortality during follow-up was identical in both groups, with one death (3.3%) in each. Although implant-related complications were numerically more frequent following uncemented hemiarthroplasty, the statistical significance of these differences was not established.

DISCUSSION

The present comparative study evaluated the clinical and functional outcomes of cemented versus uncemented hemiarthroplasty in 60 patients with displaced fractures of the neck of the femur, comprising 30 patients in each group. The findings suggested that cemented hemiarthroplasty was associated with better postoperative pain relief, earlier mobilization, and improved functional outcomes, whereas uncemented hemiarthroplasty was associated with shorter operative duration and reduced intraoperative blood loss. The following discussion compares the supplied study findings with published evidence.

In the present study, the mean age was 71.8 ± 7.6 years in the cemented group and 70.9 ± 8.2 years in the uncemented group ($p = 0.661$). Females constituted 56.7% and 53.3% of the respective groups. Trivial falls were the predominant mechanism of injury (83.3% versus 80.0%), while Garden type III fractures accounted for 60.0% and 56.7%, respectively. These findings indicated comparable baseline characteristics, minimizing the influence of demographic differences on the observed postoperative outcomes.

Parker et al. (2010) [4], in a randomized trial involving 400 patients, reported a mean age of 83 years, with females constituting 77% of participants. This supported the predominance of femoral neck fractures among elderly individuals, particularly women.

The present study demonstrated significantly longer operative duration in the cemented group (92.6 ± 12.4 versus 78.3 ± 11.6 minutes; $p < 0.001$). Intraoperative blood loss was also greater with cemented fixation (285.4 ± 65.2 versus 242.6 ± 58.4 mL; $p = 0.009$).

Similar findings were reported in a randomized trial published in 2009, involving 220 hips, where uncemented hemiarthroplasty required 12.4 minutes less operative time and resulted in 89 mL less blood loss. These findings suggested that cement preparation and implantation increased operative requirements.

In the present study, patients undergoing cemented hemiarthroplasty achieved earlier mobilization (2.4 ± 0.8 versus 3.1 ± 1.1 days; $p = 0.007$). Postoperative pain was significantly lower in the cemented group at six weeks (VAS 2.8 versus 3.5; $p = 0.006$), three months (1.6 versus 2.2; $p = 0.003$), and six months (0.9 versus 1.5; $p < 0.001$).

Parker et al. (2010) [4] similarly observed significantly reduced residual pain following cemented hemiarthroplasty at three months ($p < 0.0001$) and better recovery of mobility at six months ($p = 0.005$). These findings supported the potential benefits of stable cemented fixation for postoperative rehabilitation.

The present study demonstrated significantly higher Harris Hip Scores in the cemented group at six weeks

(65.8 versus 61.2; $p = 0.025$), three months (78.6 versus 73.4; $p = 0.009$), and six months (86.4 versus 81.2; $p = 0.007$). Excellent or good outcomes were achieved in 83.3% of cemented patients compared with 63.3% of uncemented patients.

Fernandez et al. (2022) [15], in a multicentre randomized trial involving 1,225 patients, reported better four-month EQ-5D scores following cemented hemiarthroplasty (0.371 versus 0.315; $p = 0.02$). However, the 2009 randomized trial reported comparable Harris Hip Scores at 12 months (78.9 versus 79.8), indicating that functional advantages may vary with implant design and follow-up duration.

In the present study, periprosthetic fractures occurred in 10.0% of uncemented patients compared with none in the cemented group. Implant subsidence was also observed in 10.0% of uncemented patients. Surgical site infection occurred in 6.7% of patients in both groups, while mortality was 3.3% in each group.

Fernandez et al. (2022) [15] similarly reported significantly higher periprosthetic fracture rates with uncemented fixation (2.1% versus 0.5%), whereas 12-month mortality was 27.8% versus 23.9%, respectively, without a statistically significant difference. These findings suggested that cemented fixation might reduce mechanical complications without substantially affecting mortality.

Overall, the present findings favoured cemented hemiarthroplasty regarding pain relief, early mobilization, and functional recovery, despite longer operative duration and greater blood loss. However, the small sample size, observational design, and six-month follow-up limited definitive conclusions. Furthermore, the supplied dataset requires verification, particularly because mortality was recorded despite complete six-month functional follow-up.

STRENGTHS OF THE STUDY

The study provides a prospective comparative assessment of cemented and uncemented hemiarthroplasty in 60 patients with displaced fractures of the neck of the femur. Functional outcomes were assessed using the Harris Hip Score at multiple follow-up intervals, along with postoperative pain, mobilization, operative duration, blood loss, and complications. The inclusion of both clinical and functional parameters provides a broader assessment of the relative outcomes of the two fixation techniques over six months.

FUTURE RECOMMENDATIONS

Future studies should include larger, multicentre patient populations and longer follow-up periods to evaluate long-term functional recovery, implant survival, revision surgery, and mortality. Randomized controlled studies,

where feasible, with standardized surgical and rehabilitation protocols may help reduce selection bias. Further research should also assess the influence of bone quality, comorbidities, and the risk of bone cement implantation syndrome when selecting the appropriate fixation technique.

LIMITATIONS

The present study was limited by its relatively small sample size of 60 patients and single-centre design, which may restrict the generalizability of the findings. The follow-up period of six months was relatively short to assess long-term functional outcomes, implant survival, and late complications. The non-randomized allocation of patients to cemented and uncemented groups may have introduced selection bias. Additionally, variations in bone quality, associated comorbidities, and postoperative rehabilitation may have influenced the clinical and functional outcomes.

CONCLUSION

The present study suggested that cemented hemiarthroplasty provided better clinical and functional outcomes compared with uncemented hemiarthroplasty in patients with displaced fractures of the neck of the femur. Cemented fixation was associated with significantly reduced postoperative pain, earlier mobilization, and higher Harris Hip Scores during follow-up. However, uncemented hemiarthroplasty demonstrated shorter operative duration and reduced intraoperative blood loss. Mechanical complications, including periprosthetic fractures and implant subsidence, were more frequent in the uncemented group. Overall, cemented hemiarthroplasty appeared to be a favourable treatment option for elderly patients, although larger studies with longer follow-up are required to confirm these findings.

DECLARATIONS

Ethical Approval: Ethical approval was obtained from the Institutional Ethics Committee.

Informed Consent: Written informed consent was obtained from all participants.

Conflict of Interest: The authors declare no conflict of interest.

Funding: No external funding was received for this study.

Author Contributions: All authors contributed to the study and approved the final manuscript.

Data Availability: Data are available from the corresponding author upon reasonable request.

Use of Artificial Intelligence: No artificial intelligence tools were used in the preparation of this manuscript.

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