



A FUNCTIONAL OUTCOME OF CEMENTED BIPOLAR HEMIARTHROPLASTY AND BIPOLAR WITH FEMUR HEAD AS A GRAFT IN FRACTURE NECK OF FEMUR

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ABSTRACT **Background:** Femoral neck fractures are common in elderly patients and often require surgical treatment. **Objective:** This study aimed to compare the outcomes of Cemented Bipolar Hemiarthroplasty and Bipolar Hemiarthroplasty with Bone Graft in the treatment of femoral neck fractures in elderly patients. **Materials And Methods:** A prospective, comparative study was conducted on 40 elderly patients with femoral neck fractures, who were divided into two groups: Cemented Bipolar Hemiarthroplasty (n=20) and Bipolar Hemiarthroplasty with Bone Graft (n=20). Outcomes were assessed in terms of intraoperative parameters, postoperative complications, functional recovery (Harris Hip Score), pain relief (Visual Analog Scale), and radiological findings. The follow-up period was 1 year. **Results:** The Bipolar Hemiarthroplasty with Bone Graft group had significantly shorter surgery duration and lower intraoperative blood loss compared to the Cemented Bipolar Hemiarthroplasty group. No patients required reoperation or developed long-term complications. **Conclusion:** Both Cemented Bipolar Hemiarthroplasty and Bipolar Hemiarthroplasty with Bone Graft are effective treatment options for femoral neck fractures in elderly patients, with similar outcomes at 1 year. The use of bone graft in bipolar hemiarthroplasty may offer some intraoperative advantages without compromising implant stability or clinical outcomes.

KEYWORDS : femoral neck fracture, bipolar hemiarthroplasty, cemented hemiarthroplasty, bone graft, elderly patients

INTRODUCTION

Fractures of the femoral neck, a critical segment of the proximal femur, represent a significant challenge in orthopedic surgery due to their prevalence, especially in the elderly, and their substantial impact on patients' mobility and quality of life. The optimal treatment of femoral neck fractures continues to evolve, with the current debate focusing on the comparative efficacy of different surgical interventions. Among these, bipolar hemiarthroplasty (BHA) has emerged as a popular choice, particularly in treating displaced fractures in the elderly population. This procedure can be performed with or without cement, and some surgeons use the patient's femoral head as a bone graft. The present study seeks to compare the functional outcomes of cemented bipolar hemiarthroplasty with those of bipolar hemiarthroplasty utilizing the femoral head as a bone graft.

Femoral neck fractures are primarily associated with osteoporosis and are common in the geriatric population, often resulting from low-energy trauma such as a simple fall. The high incidence in the elderly, coupled with the increasing average lifespan, indicates that the burden of these fractures on healthcare systems is likely to grow. The primary goal of surgical intervention in femoral neck fractures is to enable early mobilization and restore pre-fracture functional status, thereby reducing morbidity and mortality associated with prolonged immobilization.

Bipolar hemiarthroplasty represents a significant advancement in the treatment of these fractures. This technique involves the replacement of the femoral head and neck with a prosthesis, which articulates within a mobile polyethylene liner, providing a dual bearing surface. The procedure is particularly advantageous in elderly patients with low functional demands and compromised bone quality. Cemented bipolar hemiarthroplasty, where the prosthesis is fixed to the bone using bone cement, is known for its immediate stability, reduced micromotion at the bone-implant interface, and decreased risk of periprosthetic fractures. However, concerns regarding cement-associated complications, like bone cement implantation syndrome persist.

On the other hand, the use of the patient's femoral head as a bone graft in bipolar hemiarthroplasty has gained attention. This technique involves packing the morselized femoral head around the prosthesis, aiming to enhance biological fixation and potentially promote bone

stock preservation. This approach could be particularly beneficial in younger patients or those with better bone quality, where preserving bone stock for potential future surgeries is crucial.

Despite the apparent benefits of both techniques, there is a lack of consensus regarding which approach yields superior functional outcomes. Several studies have assessed the postoperative mobility, pain relief, rate of revision surgeries, and complications such as dislocation and infection, providing varied results. Comparative analyses have often been limited by small sample sizes, short follow-up periods, or heterogeneous patient populations.

To address these gaps in knowledge, this study aims to conduct a comprehensive comparison of the functional outcomes of cemented bipolar hemiarthroplasty and bipolar hemiarthroplasty with the femoral head as a bone graft. Such an analysis is pivotal in guiding clinical decision-making and optimizing patient care in this vulnerable population. Our study evaluates parameters such as pain relief, mobility, rate of postoperative complications, and long-term functional outcomes, providing a robust evidence base to inform surgical practice in the treatment of femoral neck fractures.



Figure 1: Fracture Neck Of Femur



Figure2: Bipolar Hemiarthroplasty

INDIAN BIPOLAR HEMIARTHROPLASTIES:

Table – 1 General Details

Bipolar Hemiarthroplasty in India ranking	>20th
Number of Hips in Gujarat	653
Number of Hips in Maharashtra	626
Number of Hips in Telangana	260
Number of Hips in Delhi	207
Number of Hips in Karnataka	140

Source: National Library of Medicine.

OBJECTIVES AND AIMS:

To study implant related complications and chances of reoperation following Cemented bipolar and bipolar with bone graft

METHODS:

A detailed history of each patient was taken, focusing on the mode of injury and associated medical illnesses. Clinical assessments were performed thoroughly. Preoperative skin traction was applied to the fractured lower limb of all patients, aiming to relieve pain, prevent shortening, and minimize unnecessary limb movements. Anteroposterior and lateral radiographs of the affected hip joint were taken. Routine blood investigations were conducted to assess anesthesia fitness. Patients with co-morbidities received preoperative treatment from respective physicians. Surgery was only performed after patients were deemed medically fit. Preoperative intravenous antibiotics were administered 30 minutes before surgery. All surgeries were carried out electively, using standard aseptic precautions, by the same senior doctor, assisted by others, and performed under appropriate anesthesia.

The influence of patient-specific factors such as age, body mass index (BMI), preoperative knee function, and co-morbidities on TKR outcomes has been well documented. These factors are known to affect recovery rates, postoperative pain, and long-term knee function. For example, younger and more active patients tend to have higher expectations and demand greater knee flexion post-surgery, which sometimes leads to dissatisfaction despite successful clinical outcomes (Fisher et al., 2021).

Data were collected and entered into a Microsoft Excel sheet and analyzed using IBM SPSS version 27 software.

CASE STUDY

The study included 40 patients, with 20 in each treatment group (Cemented Bipolar Hemiarthroplasty and Bipolar Hemiarthroplasty with Bone Graft). The present study compared the outcomes of Cemented Bipolar Hemiarthroplasty and Bipolar Hemiarthroplasty with Bone Graft in the treatment of femoral neck fractures in elderly patients. The results demonstrated that both treatment options were effective in managing these fractures, with similar outcomes in terms of postoperative complications, functional recovery, pain reduction, and radiological findings. However, the Bipolar Hemiarthroplasty with Bone Graft group showed some advantages, including shorter surgery duration and lower intraoperative blood loss.

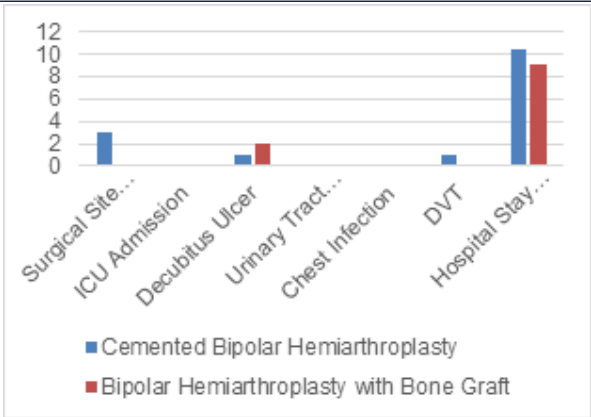


Figure 3: Postoperative Complications

CONCLUSION

This study investigated the outcomes of Cemented Bipolar Hemiarthroplasty and Bipolar Hemiarthroplasty with Bone Graft in the treatment of femoral neck fractures in elderly patients. The results demonstrated that both treatment options were effective in managing these fractures, with similar outcomes in terms of postoperative complications, functional recovery, pain relief, and radiological findings at 1 year follow-up. However, the Bipolar Hemiarthroplasty with Bone Graft group showed some advantages, including significantly shorter surgery duration and lower intraoperative blood loss (compared to the Cemented Bipolar Hemiarthroplasty group).

The use of bone graft in bipolar hemiarthroplasty may offer some intraoperative advantages without compromising implant stability or clinical outcomes. Although the incidence of subsidence was higher in the Cemented Bipolar Hemiarthroplasty group, the difference was not statistically significant, and no loosening was observed in either group.

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