



A Prospective Study Comparing The Functional Outcome Of Bipolar Hemiarthroplasty Versus Total Hip Replacement In Elderly Patients With Fracture Of The Neck Of Femur

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Abstract

Introduction: Older adults with displaced femur neck fractures frequently require surgery, either a total hip replacement (THR) or bipolar hemiarthroplasty (BHA). Nonetheless, there is ongoing debate on the ideal prosthesis. The purpose of this study is to evaluate the functional results of THR versus BHA in older individuals who have displaced femur neck fractures.

Materials and Methods: This prospective research, which involved 40 patients over 60 with displaced femur neck fractures, was carried out between December 2019 and December 2021. Patients were randomized to either THR or BHA treatment. At one month, three months, six months, and one year following surgery, Harris hip scores were evaluated.

Results: The THR group's Harris hip scores were consistently higher than the BHA group's during the follow-ups. The mean Harris hip scores at one month, three months, six months, and one year were 59.95, 66.25, 68.80, and 75.70 in the BHA group, respectively. The mean Harris hip scores for the THR group were 65.06, 69.40, 72.50, and 78.19, in that order.

Conclusion: When it comes to treating displaced fractures of the femur neck in older patients, THR outperforms BHA because to its higher Harris hip scores and reduced complication rates.

Keywords: NIL

Introduction

An increasing source of morbidity and death in the elderly is femur neck fractures. Hip fractures are predicted to become more common as life expectancy climbs worldwide, presenting a serious public health concern.¹ These fractures are frequently caused by little falls or twisting injuries, and they are made worse by comorbidities, osteoporosis, starvation, and diminished physical capacity. There is ongoing discussion on the best prosthesis to use when treating older individuals with displaced femoral neck fractures.²

Restoring patients to their pre-morbid functional state is the main objective of therapy. This entails selecting between main prosthetic replacement alternatives, such as total hip replacement (THR) or bipolar hemiarthroplasty (BHA).³ In this study, older individuals with displaced femur neck fractures will have their functional results via BHA and THR compared.⁴

Materials & Methods

Study conducted from December 2019 to January 2023 at, GMC hospital, Barmer, Department of

Orthopaedics hosted this prospective research. Prior to the study, ethical committee clearance was acquired. The inclusion criteria were independent walking prior to the accident, age above 60, displaced femur neck fractures, and no anesthetic contraindication. Pathological fractures, non-ambulatory individuals prior to injury, and hip osteoarthritis or rheumatoid arthritis were among the exclusion criteria.

THR or BHA was randomly allocated to forty individuals. Preoperative skin traction was used to keep the skin from shortening and to relieve discomfort. Moore's posterior method was used for all patient surgeries, and deep vein thrombosis

prophylaxis was given. Both groups had the same rehabilitation regimen, which included vigorous exercises and full weight bearing three days after surgery. Harris hip scores were used to measure patients' functional status at one, three, six, and one year intervals.

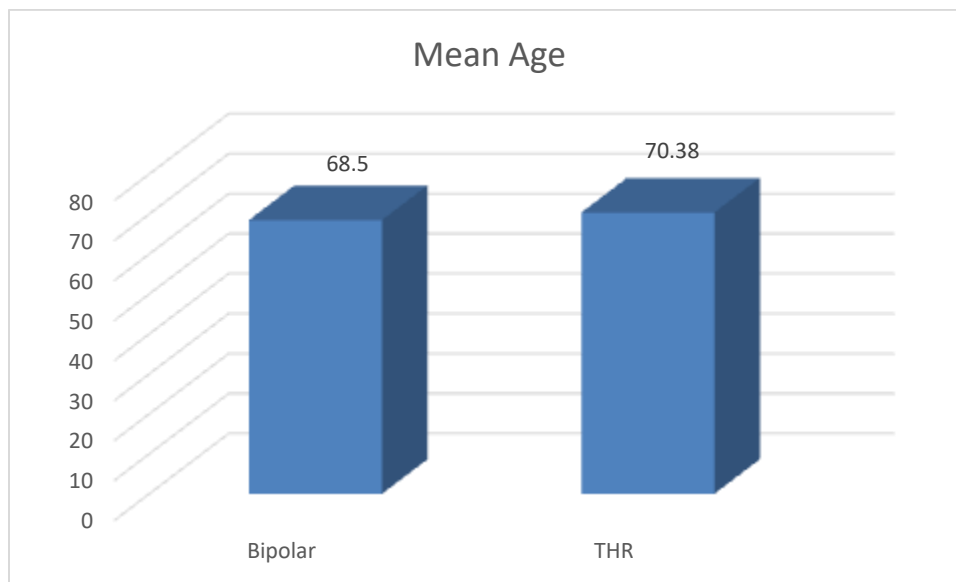
Statistical Analysis: The information was shown as percentages, frequencies, and mean \pm standard deviation. For categorical and continuous variables, the chi-square test and unpaired t-test were utilized, respectively. Mean score changes were evaluated using the paired t-test; a p-value of less than 0.05 was deemed significant.

Results

Table 1: Patient Demographics

| | Age (years) | Sex |
|---------|------------------|---------|
| Bipolar | 68.50 \pm 7.73 | 7M, 13F |
| THR | 70.38 \pm 8.09 | 9M, 11F |

Figure 1: Mean Age



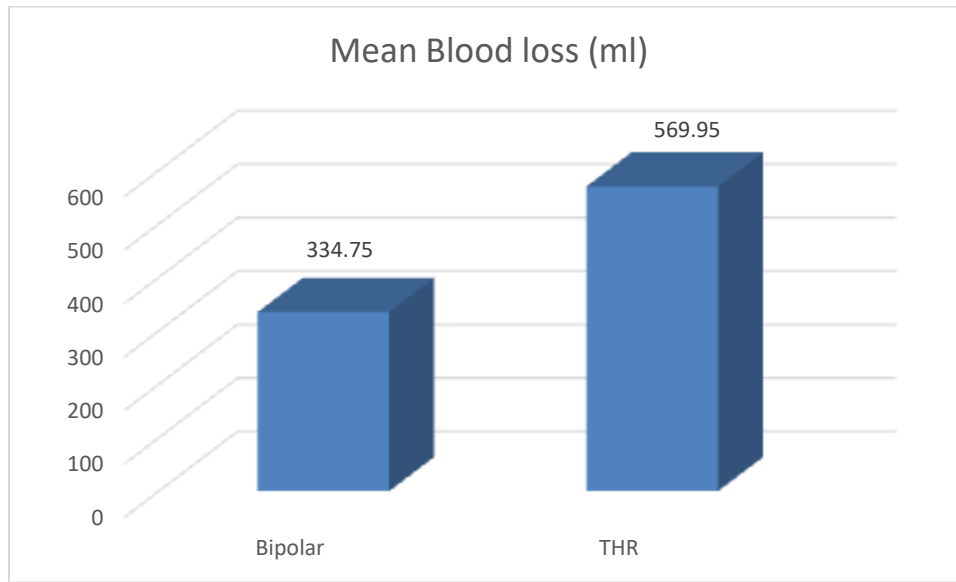
The detailed surgery data of the patients are presented in Table 2. The mean duration of surgery was significantly higher in the THR group (133.19 minutes) compared to the BHA group (55.95 minutes). The mean blood loss was also significantly higher in the THR group (569.06 ml) compared to the BHA group (334.75 ml). Additionally, the mean amount of blood transfusions was higher in the THR group (seven patients) compared to the BHA group (four patients). These differences between the two groups in terms of the duration of surgery, blood loss, and amount of blood transfusion were statistically significant ($p < 0.05$). Thus, considering the

duration of surgery, total blood loss during surgery, and amount of blood transfusion, BHA was found to be superior to THR.

Table 2: Operative Record Of Patients Thr, Total Hip Replacement

| | Bipolar | THR | P-Value |
|-------------------------------|----------------|----------------|----------------|
| Duration of surgery (minutes) | 55.95 ± 7.01 | 133.19 ± 21.02 | <0.0001 |
| Blood loss (ml) | 334.75 ± 38.91 | 569.06 ± 49.13 | <0.0001 |

Figure 2: Mean Blood Loss



The functional outcomes of patients in both groups were assessed using the Harris hip score during follow-ups at one month, three months, six months, and one year, as illustrated in Figure 1. In the BHA group, the mean Harris hip score was 59.95, 66.25, 68.80, and 75.70 at the follow-up visits at one month, three months, six months, and one year, respectively. In the THR group, the mean Harris hip scores were 65.06, 69.40, 72.50, and 78.19 at the corresponding follow-up visits. Notably, at all follow-ups, the Harris hip score was consistently higher in patients of the THR group compared to the BHA group, suggesting superior functional outcomes with THR.

Figure 3 And 4: Bipolar Hemiarthroplasty

Figure 3:



Figure 4:



Discussion

The treatment of elderly patients with displaced femoral neck fractures is still up for discussion. Prior research recommends THR for younger patients with higher life expectancies and higher functional demands, and BHA for elderly patients with restricted life expectancy and low functional needs. Similar patient ages and gender distributions were seen in this research between the BHA and THR groups.⁵

Consistent with earlier research, BHA showed a much quicker surgical time and minimal blood loss. But according to reports, the BHA group experienced more difficulties, which is in line with research by Dawson et al.⁶ and Ossendorf et al.⁷ Consistent with findings by Ossendorf et al. and Dawson et al., problems were more common in the BHA group despite the fact that THR required a lengthier surgical procedure and greater blood loss.

A meta-analysis by Burgers et al. supported the superiority of THR over other arthroplasty modes, with a significantly higher total Harris hip score. In our study, THR consistently exhibited higher mean Harris hip scores at all follow-up intervals, emphasizing its better functional outcomes.⁸

Both BHA and THR frequently encountered wound infections and other problems, while BHA required more revisions because to acetabular erosion.

Interestingly, our analysis included two patient revision cases: one for acetabular erosion and the other for recurrent dislocation. Comparing it to Sehat K et al.'s work provides important context for understanding that the 28 patient comparison was not limited to only two patients.⁹

Conclusions

In elderly patients with displaced fractures of the neck of the femur, THR emerges as a superior option compared to BHA. Despite BHA demonstrating shorter surgery duration and less blood loss, THR consistently displayed better functional outcomes, as reflected in higher Harris hip scores. Therefore, THR can be considered the primary treatment modality for elderly patients with displaced fractures of the neck of the femur, emphasizing its advantages of lower complication rates and superior Harris hip scores.

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