

EVALUATION OF THE RESULTS BETWEEN BIPOLAR HEMIARTHROPLASTY AND TOTAL HIP REPLACEMENT FOR ELDERLY PATIENTS WITH INTRACAPSULAR NECK FEMUR FRACTURES

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Abstract

Background: One of the most frequent injuries that cause morbidity and mortality in the elderly is a fracture of the femur's neck. study aimed to compare the outcomes of total hip replacement (THR) and bipolar hemiarthroplasty for the treatment of displaced femoral neck fractures in elderly patients. **Materials and Methods:** It was a prospective study was conducted at a tertiary care centre in the department of orthopaedics, after obtaining institutional ethical clearance between June 2023 and January 2024. Patients with displaced femoral neck fractures who presented to the emergency department were admitted and underwent surgical treatment. By obtaining medical histories and doing physical examinations, patient records were gathered. The study only included patients who were independent in their everyday activities before the incident. Excluded patients included those with open fractures, suspected pathological fractures, concomitant fractures, head injuries, or insufficient funds for surgery. **Result:** The most common age group for hemiarthroplasty is 71-75 years (40%) and THR is same. The study is male preponderance (54%) and females (46%). In our study of 30 patients, as per modified hip score at 3 months showed 15 patients of THR, excellent outcome is seen in 13% patients. Also, good outcome is seen in 67% patients while 1 (7%) case of poor result. Mostly the common complications were dislocation and surgical site infection, nerve injury and component loosening seen in both THR and Bipolar procedures and it was non-significant. **Conclusion:** THR seems to be a better option than bipolar prosthesis for treating femur neck fractures in the elderly, based on the study's short-term functional outcomes.

INTRODUCTION

A common injury among the elderly is a femoral neck fracture, which has a high risk of morbidity and death.^[1,2] In terms of the best course of action and results, it poses a serious challenge to orthopaedic surgeons and is still the subject of continuous research and discussion. Age, severe osteoporosis, and comorbidities are common characteristics of patients who have femoral neck fractures.^[3] Encouraging the patient to start walking around early on is the main objective of treatment. Surgical procedures including the use of a main prosthetic replacement—either a bipolar prosthesis or a total hip replacement (THR)—can accomplish this.^[4]

The purpose of this study is to compare and assess the outcomes of patients with displaced femoral neck fractures who underwent treatment with a bipolar prosthesis or THR using the modified Harris hip score.^[5] This study intends to add to the body of

information regarding the available treatment options for femoral neck fractures and provide insights into the optimal strategy for optimizing patient mobility and overall results by measuring functional outcomes.

MATERIALS AND METHODS

It was a prospective study was conducted at a tertiary care centre in the department of orthopaedics, after obtaining institutional ethical clearance between June 2023 and January 2024. Patients with displaced femoral neck fractures who presented to the emergency department were admitted and underwent surgical treatment. By obtaining medical histories and doing physical examinations, patient records were gathered. The study only included patients who were independent in their everyday activities before the incident. Excluded patients included those with open fractures, suspected pathological fractures,

concomitant fractures, head injuries, or insufficient funds for surgery.

Methodology: Two groups of patients were created: group 1 was given a bipolar prosthesis, while group 2 was given a THR. Thirty patients in all were involved in the trial, fifteen of whom were in the THR group and fifteen in the bipolar prosthesis group. Each patient underwent a thorough history and clinical evaluation. Skin traction was used on the afflicted lower leg for two to three days before to surgery in order to reduce pain and avoid shortening and needless motions. Pain was managed with the use of analgesics. For each patient, radiographs of the afflicted hip joint and pelvis were obtained.

The traditional posterior route was used to do the surgery. Most procedures were performed in two to three days after the patient was deemed fit for anesthesia. Both groups underwent comparable post-surgical therapy, which comprised a joint-care regimen and rehabilitation techniques. Within the first three days following surgery, full weight-bearing and vigorous workouts were started, if tolerated. After five to seven days, patients were released in accordance with protocol, and they continued their therapy throughout the study period. Functional evaluation was conducted using the modified Harris hip score at 3, 6, and 12 months following surgery.

Statistical Analysis: The statistical analysis was performed using SPSS for windows version 22.0 software (Mac, and Linux). The findings were present in number and percentage analyzed by frequency, percent, and Chi-square test. Chi-square test was used to find the association among variables. The critical value of P indicating the probability of

significant difference was taken as <0.05 for comparison.

RESULTS

As per [Table 1] the most common age group for hemiarthroplasty is 71-75 years (40%) and THR is same. The study is male preponderance (54%) and females (46%).

As per [Table 2] Maximum patients were of type IV (54%) followed by type III (33%) according to Garden classification who are treated with THR and bipolar arthroplasty.

As per [Table 3] In our study of 30 patients, as per modified hip score at 3 months showed 15 patients of THR, excellent outcome is seen in 13% patients. Also, good outcome is seen in 67% patients while 1 (7%) case of poor result. 15 patients of bipolar excellent outcome are seen in 20% patients and good outcome is seen in 53% patients while 1 (7%) case of poor result and it was statistically significant ($p < 0.05$), similarly it was statistically significant in excellent and good outcome at 6 and 12 months but non-significant in fair and poor outcome.

As per [Table 4] it was seen that 67% had no complications when the procedure was THR and 60% had no complication when the procedure was Bipolar. Mostly the common complications were dislocation and surgical site infection, nerve injury and component loosening seen in both THR and Bipolar procedures and it was non-significant.

As per [Table 5] it was seen that 80% of THR procedures were operated in less than 120 minutes while and 93% of Bipolar operating time was <120minutes and it was statistically significant.

Table 1: Age wise distribution of study participants

Age in years	No. of patients (hemiarthro- plasty)	%	No. of patients (THR)	%
50-60	3	32	1	7
61-70	4	36	5	33
71-75	6	40	5	33
75-80	1	7	2	8
<80	1	7	2	8
Total	15	100	15	100

Table 2: Comparison as per Garden Classification

S. no.	Type	No. of cases	%
1	I	0	0
2	II	4	13
3	III	10	33
4	IV	16	54
	Total	30	100

Table 3: Modified Hip score at 3,6 and 12 month

Score	THR			Bipolar			p-value
	3m	6m	12m	3m	6m	12m	
Excellent	2	3	4	3	2	2	0.01
Good	10	9	8	8	6	5	0.01
Fair	2	2	2	3	6	7	0.11
Poor	1	1	1	1	1	1	0.21

Table 4: Comparison of complication between procedures

Criteria	THR	Bipolar	p-value
Nerve injury	1	1	0.11
Periprosthetic fractures	0	1	

Dislocation	1	1	
Varus	1	1	
Component loosening	1	1	
Surgical site infection	1	1	
No complications	10	9	

Table 5: Comparison of Operative time between procedures

Operating time	THR	Bipolar	p-value
<120 min	12	14	0.01
>120 min	3	1	

DISCUSSION

An osteopaedic surgeon's objective in treating an intracapsular neck femur fracture is a hip that is pain-free and has enough strength and movement to allow for regular activities and function. Although nobody is flawless, this is what a patient anticipates from the surgeon as well. The intricate process of human mobility may be the cause of this, requiring coordinated movement of the musculoskeletal system through conscious and subconscious neural control and feedback mechanisms.^[6]

With a p-value of 0.1235.1, 7,8,9, few studies report mean ages of 68.5±6.5 for bipolar hemiarthroplasty and 65.36±6.5 for total hip arthroplasty. In this prospective analysis, 47 patients with femur neck fractures who were older than 60 were enrolled. Of these, 25 patients received cemented bipolar prostheses, and the remaining 22 received cemented total hip replacements.

Blomfeldt et al. state that the complete hip replacement group had a longer surgical time (102 minutes, ranging from 70 to 151) than the other group (78 minutes, ranging from 43 to 131) (p<0.001).^[7] According to Shukla et al., the bipolar prosthesis group's mean surgery duration (82.12 min) was considerably lower than the mean surgery duration of the THR group (110.00 min) (p<0.0001).^[8-11] The hemiarthroplasty group's mean operation time was 35 minutes, whereas the THR group's was 45 minutes.

Compared to the bipolar prosthesis group, THR had considerably greater gait, activity, and range of motion scores. At the one-year follow-up, the THR group's mean Harris hip score was higher than the group that had hemiarthroplasty. After THA compared to HA, the weighted mean of the Harris hip score was 81 points. Six The weighted mean score for the HHS subdomain pain after THA was 42, while the score for HA was 39. Additionally, 75% of patients reported mild to no pain after THA, compared to 56% after HA.

In our study of 30 patients, as per modified hip score at 3 months showed 15 patients of THR, excellent outcome is seen in 13% patients. Also, good outcome is seen in 67% patients while 1 (7%) case of poor result. 15 patients of bipolar excellent outcome are seen in 20% patients and good outcome is seen in 53% patients while 1 (7%) case of poor result and it was statistically significant (p<0.05), similarly it was statistically significant in excellent and good

outcome at 6 and 12 months but non-significant in fair and poor outcome.

In the present study the common complications were dislocation and surgical site infection, nerve injury and component loosening seen in both THR and Bipolar procedures and it was non-significant.

After debridement, the surgical site infection is managed with a pus culture report, and antibiotics are prescribed based on the patient's sensitivity. The patient resumed their regular activities after the infection subsided. One patient who underwent bipolar hemiarthroplasty had a dislocation. Dislocation happened while the patient was sitting right after stopping treatment for a month. Under general anesthesia, dislocation is lessened. In addition, the patient is placed in broad abduction for one month while wearing a lengthy knee brace to prevent hip and knee flexion.^[10-12]

Our study has few limitations like constraint sample size and limited time of follow up.

CONCLUSION

Complications can be reduced with careful preoperative planning, sterile surgical techniques, optimal implant selection, effective postoperative physical therapy, and patient safeguards. Our study's overall clinical and functional outcome showed great findings. The patient's actions determine the implant's durability.

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