

**Original Article**  
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# FUNCTIONAL OUTCOME OF OSTEOSYNTHESIS VS. BIPOLAR HEMIARTHROPLASTY IN ELDERLY PATIENTS WITH FRACTURE NECK OF FEMUR

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**Abstract**

**Introduction:** Controversies exists regarding the modalities of treatment while dealing with a displaced intracapsular femoral neck fracture in elderly patients. The primary objective of this study was to evaluate the functional outcome in elderly patients with fracture neck of femur treated with osteosynthesis versus bipolar hemiarthroplasty.

**Materials and methods:** This prospective randomized study comprised 30 patients with displaced femoral neck fractures treated with Osteosynthesis and 30 patients treated with Cemented Bipolar hemiarthroplasty. The patients were followed up at 2nd week, 1 month, 6 months and 1 year after surgery. The assessment of Lawton's IADL Score and timed up and go score were done at each follow-up visit.

**Results:** At the end of one year, In osteosynthesis group out of 30 patients, excellent result was achieved in 00 patients (0%), good in 04 patients (13.33%), fair in 12 patients (40%) and poor outcome was seen in 14 patients (46.67%). In Bipolar hemiarthroplasty group out of 30 patients, excellent result was achieved in 24 patients (80%), good in 04 patients (13.33%), fair in 2 patients (6.67%), no poor result was seen.

**Conclusion:** Bipolar hemiarthroplasty is a better modality for the treatment of fracture neck of femur as compared to osteosynthesis in terms of functional outcome, complications, and risk of second surgery after 1 year

of surgery.

**Keywords:** bipolar hemiarthroplasty, osteosynthesis, fracture neck of femur

## Introduction

Hip fractures are considered notorious in elderly population due to increased mortality and morbidity associated with them<sup>1</sup>. Osteoporosis is the main cause of this fracture especially in women. Studies shows that 20% to 25% of patients die after 1 year<sup>2</sup>, 40% are still unable to walk independently, 60% have difficulty with at least one essential activity of daily living, and 80% are restricted in other daily activities<sup>3</sup>. Growing number of elderly population in developing countries burden the economy due to high medical expenses required for the treatment. It has been estimated as a result of an increasing proportion of elderly people in the world, the number of hip fractures will approximate four million in 2025<sup>4</sup>.

Fracture neck of femur management in elderly population is always a debatable subject due to no clear guidelines of treatment<sup>5,6,7</sup>. Many modalities of treatment have been adopted by each surgeon to address these fracture which includes, Osteosynthesis with cannulated cancellous screws or Dynamic Hip screw, Hemiarthroplasty and Total Hip Arthroplasty<sup>5</sup>. Many studies have been conducted to scientifically prove the best treatment option but results are inconclusive.

Many studies have shown that Hemiarthroplasty and Total Hip Arthroplasty are superior to Osteosynthesis in terms of pain relief, time to return to activity, patient satisfaction, revision surgery<sup>8,9,10</sup>.

## Materials and methods

This is a prospective randomized study done at G.R Medical college Hospital since Nov. 2014 to Oct. 2015 for a period of one year. A total of 60 elderly patients with Intracapsular

fracture neck of femur are divided into two groups (Group A & Group B). Group A comprised 30 patients with displaced femoral neck fractures treated with Osteosynthesis and 30 patients of Group B are treated with Cemented Bipolar hemiarthroplasty. Age of the patients are in range of 55-75 years with mean age of 64 years. There are 42 females and 18 males in the study group.

In the fixation group (Group-A) out of 30 patients, 22 patients were treated with three cancellous cannulated screws fixed in inverted triangle fashion, where as remaining 8 patients were operated with DHS with derotation screw. Closed reduction is done in all the cases.

Where as, all the patients of group B are treated with hemiarthroplasty and cemented bipolar prosthesis.

Group A patients are not allowed to bear weight for 6 weeks where as Group B patients are mobilized with full weight bearing from 2<sup>nd</sup> post op day. The patients were followed up at 2<sup>nd</sup> week, 1 month, 3 months, 6 months and 1 year after surgery. The assessment of Harris Hip Score, Lawton's IADL Score, and timed up and go score were done at each follow-up visit.

## Observation and Result

Age of the patients were in the range of 55 to 75 years with mean age of 64 years. The majority of patients were females (52%). Left side was more commonly affected (62%) and fall on ground was the most common mode of injury (92%). Out of 60 patients, 3 patients (6%) had Garden type II fracture, 8 patients (16%) had Garden type III fracture and 49 patients (78%) had Garden type IV fracture. Out of 60 patients, 32 patients (53%) were operated in <10 days since injury

and 28 patients (47%) were operated within 10-30 days since injury.

During the follow up period of complete one year, there were no mortality seen in both the groups. Patient became bed ridden and unable to do their routine activities is seen more in Group-A compared to Group-B.

One case (3%) got infected in the Group-B which required implant removal and antibiotic cement spacer insertion. There is no other complications noted.

Where as, in Group-A 3 patients (10%) had a complication of Implant failure and 2 patients (2%) had Osteonecrosis with in a period of 6 months post surgery and operated with Hemiarthroplasty

Lawton's IADL (Instrumental Activities of Daily Living) score was 4 to 6 amongst the patients of Group-B and 1-2 amongst the Group-A.

Timed Up and Go Test Score in Group-A was with a mean score of 32 seconds, Where as in Group-B was 24 seconds.

## Discussion

Bloomfeldt<sup>11</sup> et al did a randomized control trial comparing internal fixation vs total hip replacement in elderly population with displaced acute fracture neck of femur and drawn conclusion that 97% of the arthroplasty group had no hip complications compared to 57% in the fixation group. 89% of the arthroplasty group were living independently post surgery compared to 70% of internal fixation group. It shows outcomes in Arthroplasty group is better compared to fixation group.

Bartels<sup>12</sup> et al in his study, 2,713 patients were treated between 2005 and 2012. 1,111 patients were treated with IF, 1,030 with HA and 572

patients with THA. Major reoperations (defined as re-osteosynthesis, secondary arthroplasty, exchange, or removal of prosthesis components and Girdlestone procedure), patient-reported outcome measures (satisfaction, pain, and health-related quality of life (EQ5D) after 4 and 12 months), 1-year mortality concluded that Major re-operations occurred in 27% after IF, 3.8% after HA and 2.8% after THA and hence high reoperation rate after IF and better patient-reported outcome after both THA and HA with medium follow-up

**Gjertsen<sup>13</sup> et al** studied data from 4335 patients over seventy years of age who had internal fixation (1823 patients) or hemiarthroplasty (2512 patients) to treat a displaced femoral neck fracture were compared at a minimum follow-up interval of twelve months. He declared that There were no differences in one- year mortality (27% in the osteosynthesis group and 25% in the arthroplasty group;  $p=0.76$ ). There were 412 re-operations (22.6%) performed in the osteosynthesis group and seventy-two (2.9%) in the hemiarthroplasty group during the follow-up period. After twelve months, the osteosynthesis group reported more pain (mean score, 29.9 compared with 19.2), higher dissatisfaction with the operation result (mean score, 38.9 compared with 25.7), and a lower quality of life (mean score, 0.51 compared with 0.60) than the arthroplasty group hence hemiarthroplasty is better compared to internal fixation.

**Micheal S kain<sup>14</sup> et al** published a paper on Revision Surgery Occurs Frequently After Percutaneous Fixation of Stable Femoral Neck Fractures in Elderly Patients in which he studied 121 fractures in 120 patients older than 65 years as stable (Garden Stage I or II); all were

treated with percutaneous, cannulated screw fixation in an inverted triangle without performing a capsulotomy or aspiration of the fracture hematoma at the time of surgery. The average age of the patients at the time of fracture was 80 years (range, 65–100 years). Radiographs, operative reports, and medical records were reviewed. Fracture union, nonunion, osteonecrosis, intraarticular hardware, loss of fixation, and conversion to arthroplasty were noted. He gave conclusion that Revision surgery after osteosynthesis for stable femoral neck fractures was more frequent.

In our study, 60 patients with fracture neck of femur were grouped into Internal fixation (Group-A) and Hemiarthroplasty (Group-B) group. Average age of the patients was 64 years with ranging from 55-75 years. Out of 30 patients in the internal fixation group, 5 patients came with complication (16%) where as 1 patient (2%) had complication in Hemiarthroplasty group. Mortality remains same in both groups but morbidity is more in fixation group compared to Hemiarthroplasty group.

### Conclusion

At the end of the present study, we came into conclusion that, There is an increase in incidence of fracture neck of femur in females after 50 years that may be attributed to postmenopausal osteoporosis. During our study, we came into a conclusion that fracture neck of femur is most commonly seen in 60-70 years age group. Garden type IV was the commonest type of neck of femur in our study. At the end of one year after the surgery, there is no difference in the mortality rate but there is significant difference in terms of morbidity and complications associated with internal

fixation when compared with the Hemiarthroplasty. Hence our study concludes Hemiarthroplasty is the better treatment option in the elderly population with fracture neck of femur in short term follow up, but Long term follow up is required for better understanding of the outcome.

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