

# A Study of Surgical Management of Fracture Neck of Femur in Elderly with Bipolar Hemiarthroplasty

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## ABSTRACT

**Introduction:** Femoral injuries are one of the most devastating injuries occurring in a life on an individual. Present study was done with the objective to study the age and sex incidence of fracture neck of femur, quality of life after hemiarthroplasty, morbidity and mortality associated with the procedure, recovery of physical, social and vocational independence and associated complications.

**Material and Methods:** 67 cases of fracture neck of femur in elderly patients above the age of 50 years treated by hemiarthroplasty using Bipolar endoprosthesis, in the Department of Orthopaedics at Rohilkhand medical college, M.J.P. Rohilkhand University, Bareilly, U.P. between 1st July 2014 to 31st August 2015 were followed up for 6 months and the short term functional results were analyzed by using modified Harris hip scoring system

**Results:** The age group of patients was 50 to 85 years with mean average age of 63.54 years. Females were predominant. Majority of the fractures were subcapital radiologically. In 68.66 percent cases the mode of injury was trivial trauma. There were 38.33% excellent results and 36.67% good results. Thus 86.67% of the hips were classified as having a satisfactory to excellent results.

**Conclusion:** Hemiarthroplasty for fracture neck of femur is a good option in elderly patients. Early functional results are good to satisfactory.

**Keywords:** Bipolar, Hemiarthroplasty, Femoral neck fracture, Elderly

## INTRODUCTION

Femoral neck fractures are devastating injuries that most commonly affect the elderly and have a tremendous impact on both the health care system and society in general.

The lifetime risk of sustaining a hip fracture is 40% to 50% in women and 13% to 22% in men. Life expectancy is increasing worldwide, and these demographic changes can be expected to cause the number of hip fractures occurring worldwide to increase from 1.66 million in 1990 to 6.26 million in 2050.<sup>1</sup>

The human hip is a weight bearing joint involved in many functions. A successful operation at the hip joint should provide painless, stable hip with wide range of movements.

In modern days the bipolar hip prosthesis is one of the best options, especially the modular bipolar prosthesis with or without cement which can give a very good and active life to the treated patients. An advantage is the modular stem which can be retained in case the patient needs a total hip replacement in future.

This clinical study presents the short term results of prospective randomized trial of bipolar hemiarthroplasty for the treatment of displaced femoral neck fractures in the elderly. Outcomes at 6 weeks, 3 months and 6 months were analyzed by modified Harris hip scoring system and by radiographs taken during follow up.

The functional results were analyzed with the objective, to study the age and sex incidence of fracture neck of femur, quality of life after hemiarthroplasty, morbidity and mortality associated with the procedure, recovery of physical, social and vocational independence and associated complications.

## MATERIAL AND METHODS

The present prospective study of 1 year duration included 67 cases of intra-capsular fracture neck of femur in elderly patients above the age of 50 years irrespective of sex and duration of fracture treated by hemiarthroplasty using Bipolar endoprosthesis, in the Department of Orthopaedics at Rohilkhand medical college, M.J.P. Rohilkhand University, Bareilly, U.P. between 1st July 2014 to 31st August 2015. Before the start of the study the clearance was obtained from institutional ethical committee and written informed consent was taken from the subjects.

In all patients preoperatively Buck's traction or Upper tibial steinmann traction as appropriate was done. Oral or parental NSAIDs were given to relieve the pain. Anteroposterior radiographs of the affected hip joint of pelvis with both hips keeping the limbs in 15° internal rotation were taken for all the patients. Routine blood investigations, blood grouping and typing, urine routine, RBS, serum urea, creatinine, HbsAg, HIV, chest x-ray, ECG, were done in all cases. Necessary and adequate treatment was given for those associated with medical problems such as anaemia, diabetes, hypertension, IHD, COPD, asthma, etc. before taking them to surgery.

Surgery was performed under spinal or epidural anaesthesia in lateral position with posterior approach (Moore's Approach).

Whenever necessary, postoperative blood transfusion was given. Intramuscular analgesics were given as per patients compliance, intravenous antibiotics were continued for 4 days. Both the lower limbs kept in abducted position, with a pillow in between both the legs. Drain removal was done after 48 hours. Check radiograph was taken after 48 hours.

Patients were made to sit up on the second day, standup with support (walker), on the third day, and were allowed to full weight bear and walk with the help of a walker on the seventh postoperative day depending on his/her pain tolerance and were encouraged to walk thereafter. Sitting cross-legged and squatting were not allowed.

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Suture removal was done on the 12-14th postoperative day depending on status of wound. The patients were assessed for any shortening or deformities if any and discharged from the hospital.

Patients were followed up at an interval of 6 weeks, 3 months, and 6 months and functional outcome was analysed by modified harris hip scoring system. At each follow up radiograph of the hip was taken for radiological analysis.

**STATISTICAL ANALYSIS**

Descriptive statistics like mean and percentage were used to infer results. Microsoft excel 2007 was used to make graphs and tables.

**RESULTS**

Most of the patients were in the age group of 50 - 75 years with the mean age of 63.65 years for males and 63.57 years for females (Graph-1).

Majority (64.18%) of fractures were subcapital type on radiographic examination. Majority (79.31%) of the patients had minimal trauma most of them slipped and fell down on flat ground or in bathroom and were not able to walk or stand. Duration of stay in hospital ranged from 15 to 37 days. 95% of patients had a stay of less than 30 days in hospital (Graph-2).

Apart from 2 deaths, 5 patients were lost to follow up. These 6 patients were excluded from the final results. 2 patients had dyselektrolytemia, 4 patients had superficial infection, 1 patient had an intra-op Greater Tuberosity Fracture, 6 patients had post-op delirium which was controlled by adequate medications and electrolyte correction and 5 patients had pre-operative gluteal bed sores (Graph-3).

38.33 % of patients had no pain during follow up. 48.33 % had slight pain and none had marked pain. 86.66% of patients had none to slight pain in the operated hip whereas mild to moderate pain was noted in about 13.33% of patients. None of subjects had marked pain and had problems with daily activities (Graph-4). 88.33% had none to slight limp. Moderate limp was seen in 11.67 % of the subjects whereas only none of the subjects had severe limp (Graph-5).

In our study Harris hip score, at end of six month ranged from 100 to 41 out of which 38.33% of hemiarthroplasties had hip score of 91-100 (excellent), 36.67% of the hemiarthroplasties had scores of 81-90 (good), 11.67% had satisfactory/ fair results whereas only 13.33% of hemiarthroplasties fell in poor category with scores below 70. Thus 86.67% of the hips were classified as having a satisfactory to excellent results (Table-1).

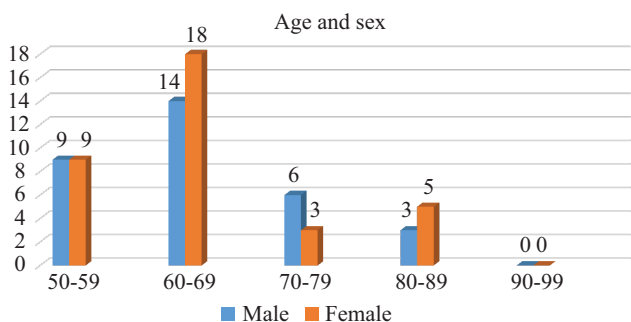
1 patient's x-rays showed radiolucent zone of more than 2 mm at the stem of prosthesis, one patients x-ray showed sclerosis at

tip of prosthesis, 1 patient had neck resorption and 2 patients had subsidence of prosthesis (Table-2).

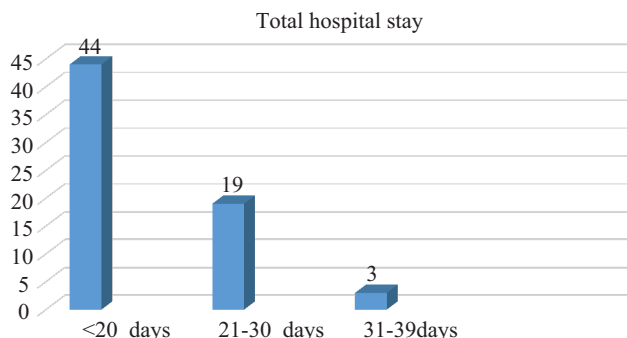
**DISCUSSION**

In active older patients especially needing early mobilization, primary prosthetic replacement should be considered.

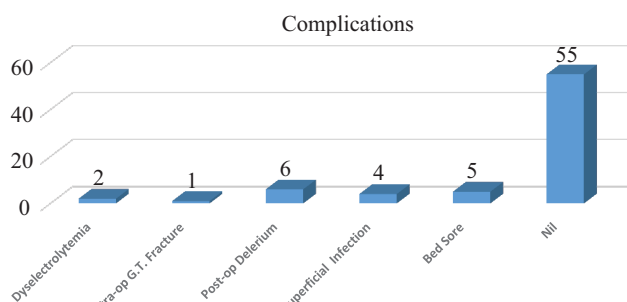
The average age in our patient group was 63.65 years in case of males and 63.57 years in case of females. Majority of the patients were between 50-75 years. Similar age distribution is reported by other authors. Saxena and Saraf<sup>2</sup> (1978) had age



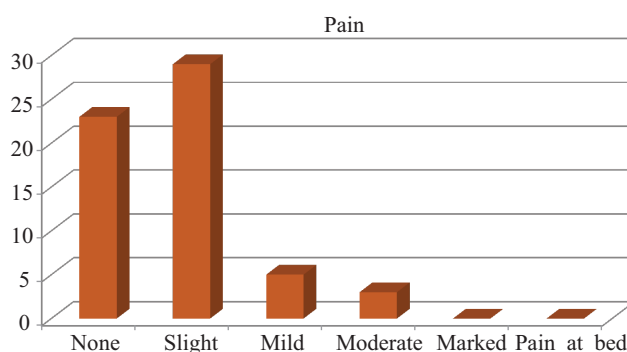
**Graph-1:** Distribution of sample by age and sex



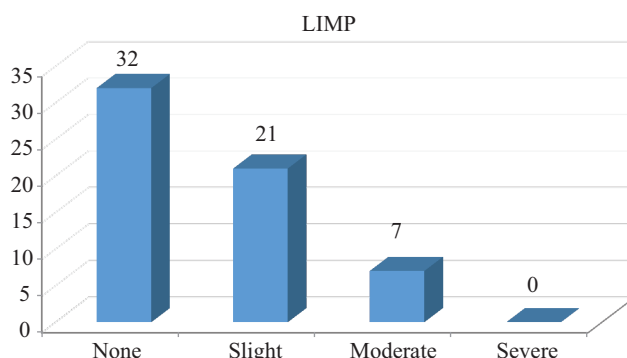
**Graph-2:** Distribution of the sample by total hospital stay



**Graph-3:** Distribution of the sample by complications



**Graph-4:** Distribution of the sample by criteria of pain



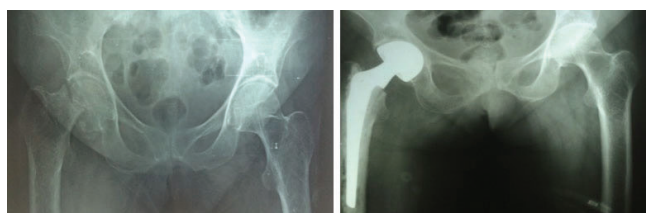
**Graph-5:** Distribution of the sample by Criteria of Limping

Results	Total Harris Hip Score	Frequency	Percentage
Excellent	91-100	23	38.33
Good	81-90	22	36.67
Fair	71-80	7	11.67
Poor	Below 70	8	13.33
Total		60	100

**Table-1:** Distribution of cases by functional results of bipolar prosthesis at the end of 6 months.

Findings	Frequency
<u>Femoral stem</u>	
1. Radiolucent Zone>2 mm	1
2. Subsidence of prosthesis>5mm	2
3. Sclerosis at the tip of prosthesis	1
<u>Acetabulum</u>	
1. Erosion	0
2. Protrusion	0
Heterotopic Ossification	0
Dislocation / Subluxation	0
Neck Resorption	1
Total	5

**Table-2:** Distribution of the sample by radiographic results at the end of 6 months



Pre-op X-ray

Post-op X-ray



Standing



Climbing stairs



Sitting cross-legged



Hip in flexion

**Figure-1:** Functional result - Excellent

distribution 45-90 years (Mean 66 years); Mukherjee and Puri<sup>3</sup> (1986) 65 years, Arwade<sup>4</sup> (1987) 54-86 years with incidence between 70-80 years (Average 72 years).

The type (subcapital or transcervical) or the displacement (Gardens III and IV) are not taken as the criteria to choose the procedure for the management of fracture neck of the femur. The age of the patient Saraf and Saxena<sup>2</sup> (1978), Mukherjee and Puri<sup>3</sup> (1986), Arwade<sup>4</sup> (1987)] and time since fracture [Boyd and Salvatore<sup>5</sup> (1964), Salvatti et al<sup>6</sup> (1974), Sikroski and Barrington (1981), G.S. Kulkarni<sup>7</sup> (1987)] are taken into consideration while selecting hemiarthroplasty for the management of fracture neck of femur. Bavadekar and Manelkar<sup>8</sup> (1987), emphasized not to choose hemiarthroplasty in Garden type I and II fractures even in old individuals. We have followed the same philosophy while selecting the patients for hemiarthroplasty.

In our series hospital stay ranges from 15 days to 37 days with a mean average of 19.86 days.

We had no operative deaths in our series. It is observed that the mortality rate varies between 10% to 40% in the western literature. In the Indian series available death rate is not very high. Low mortality is probably due to proper selection of cases. When majority of the deaths in western series were due to cardiac problems, we had only two case with established heart disease who underwent hemiarthroplasty. Low death rate may be also due to proper management of the associated medical problems preoperatively, use of antibiotics routinely and early mobilization.

In our series 4 patient (5.48%) had superficial wound infection. All patients were non- diabetic and 2 were hypertensive. They developed signs of infection in the first week of operation. They were treated with proper antibiotics and dressings. There were no cases of deep infection in our series. All these infections were found when the patients were still in the hospital and this resulted in prolongation of their hospital stay.

The organism isolated in the above cases was: Staphylococcus aureus. Superficial infections can be successfully treated with antibiotics, local measures and drainage. On the other hand, deep infections most of the time need removal of the prosthesis and thorough debridement and lavage. Early deep infections may present as mild low grade pain in the thigh or groin, or as an acute septic shock with potentially fatal clinical course. Salvatti et al<sup>6</sup> (1974), Moore (1940) and Whittaker (1974)<sup>11</sup> have reported extremely high mortality following infection of the prosthesis. Increased incidence of infection has been reported with using posterior Moore's approach for hemiarthroplasty.<sup>12</sup>

We observed that 38.33 % in our series had no pain and 48.33 % of patient had slight pain. 8.33% had mild and 5% had moderate pain but had no post operative complication.

Our good results (75%) (Figure-1) are comparable with other series Hinchey and Day<sup>9</sup> 72.8%; Lunceford<sup>10</sup> 81%; Anderson and Hamsa 80.3%; Salvatti et al<sup>6</sup>; 57%; Saxena and Saraf<sup>2</sup>; 90.9%, Mukherjee<sup>3</sup> 78%.

**CONCLUSION**

Hemiarthroplasty for fracture neck of femur is a good option in elderly patients allowing for early mobilization and saving this class of patients from hazards of recumbency for which they are prone. Early functional results are good to satisfactory.

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