

**Intracapsular Fracture Neck of Femur in Elderly Treated By Hemiarthroplasty: A Clinical Study****Subodh Kumar<sup>1</sup>, Vikas Kumar<sup>2</sup>, Narendra Kumar Sinha<sup>3</sup>**<sup>1,2</sup>Senior Resident, Department of Orthopaedics, BMIMS, Pawapuri<sup>3</sup>Associate Professor, Department of Orthopaedics, BMIMS, Pawapuri

Received: 10-07-2023 / Revised: 03-08-2023 / Accepted: 23-08-2023

Corresponding author: Vikas Kumar

Conflict of interest: Nil

**Abstract:**

**Background and Objectives:** The Study of fifty cases of intracapsular fracture neck of femur in elderly patients above the age of 50 years irrespective of sex treated by hemiarthroplasty using unipolar (Austin moore's / Thompson's ) or bipolar endoprosthesis, in the Department of Orthopedics, 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, number of days of stay in hospital and associated complications.

**Methods:** Fifty cases of fracture neck of femur in elderly patients above the age of 50 years treated by hemiarthroplasty using either unipolar or bipolar prosthesis in the Department of Orthopaedics at BMIMS Pawapuri were selected on the basis of purposive sampling or judgment sampling method.

**Conclusion:** The poor results (11.1%) were due to moderate to marked pain in the hip or thigh after hemiarthroplasty. We conclude that hemiarthroplasty for fracture neck of femur is a good option in elderly patients. The mortality and morbidity are not high, operative procedure is simple, complications are less disabling. Early functional results are satisfactory.

**Keywords:** Unipolar - Bipolar - Hemiarthroplasty - Femoral neck fracture.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

**Introduction**

Hip 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. Despite of marked improvements in implant design, surgical technique and patients care, hip fractures consume a potential proportion of our health care resources. [1] Fracture neck of femur has been recognized since the time of Hippocrates and is a common orthopaedic problem in elderly. Various methods of treatment have been employed since ages. But the problem remains an enigma unsolved till today. [1] The prolonged immobilization in elderly will jeopardize the life span of patient and further complicates the problem. This forces one to totally abandon the complete immobilization to achieve a bony union, or to resort early ambulatory procedures by surgery. The blood supply to the neck and head of the femur is extensive, intricate and complicated. [2] Healing process mainly depends on the good blood supply. These further handicaps the treatment of these fractures and the healing process is always in doubt. Under such circumstances one has to decide whether the prolonged immobilization has to be employed to achieve the bony union or quick ambulation by hemi replacement arthroplasty, to achieve fair degree of function. It is

a known fact that the hip is a weight bearing joint and has to perform many functions. A successful operation at the hip joint should provide painless, stable hip with wide range of movements. But none of the accepted procedures have been able to achieve this goal fully. The patient also needs to go through in many instances, multiple surgical procedures and a prolonged rehabilitation in order to preserve his original joint. Earlier hemi replacement arthroplasty by using vitallium or stainless steel was popularly practiced by Austin Moore's produced fairly good results. [3,4] But it had its limitations in loosening and reactions at acetabulum etc. Many of the shortcomings of this procedure were overcome by a new type of prosthesis, which had the great advantage of second joint, below the acetabulum. It was named as bipolar prosthesis, since it had an outer head of metal which articulates with the acetabulum and a second inner small metallic head which articulates with the high density polyethylene (HDPE), lining the inner surface of the outer head. This prosthesis is very useful and results are encouraging. [5] This clinical study presents the short term results of prospective randomised trial of hemiarthroplasty for the treatment of displaced femoral neck fractures in the elderly.

## Objectives

- To study the quality of life after hemiarthroplasty
- To study the morbidity and mortality rate associated with the procedure
- To study the recovery of physical, social and vocational independence.
- To study the number of days of stay in hospital
- To study the associated complications. To study the radiographic changes after hemiarthroplasty

## Material and Methods

The present study includes 50 cases of intracapsular fracture neck of femur in elderly patients above the age of 50 years irrespective of sex treated by hemiarthroplasty using unipolar (Austin Moore's / Thompson's ) or bipolar endoprosthesis, in the Department of Orthopaedics at BMIMS Pawapuri, Bihar. Study duration of Two Years. selected on the basis of purposive sampling (Judgment sampling) method. The clearance has been obtained from ethical committee. The study was carried out to evaluate the immediate and early results of hemiarthroplasty for intracapsular fracture of neck of femur in elderly.

## Exclusion Criteria

Patients with dementia 2). Patients who were nonambulatory 3) Patients with pathologic femoral neck fracture and 4) Patients with additional acute lower extremity fractures in addition to the femoral neck fracture. Fifty cases treated by hemiarthroplasty were followed up for 6 months. At the end of 6 months following surgery 2 patients died and 3 patients lost for follow up. The functional results after hemiarthroplasty are therefore analysed for the remaining 45 patients.

Once the patient was admitted to the hospital, all the essential information was recorded in the proforma prepared for this study. They were observed regularly during their hospital stay till they get discharged. They were asked to come for follow up regularly to the outpatient department. Those who did not come were reminded by post. Five patients who could not come answered the necessary questions through post. Patients were admitted to the ward. Detailed history was taken with particular emphasize on mode of injury and associated medical illness. In depth, clinical assessment was carried out in each case. In all patients preoperatively Buck's traction with appropriate weight was applied, to the fractured lower limb, with the aim of relieving pain preventing shortening and to reduce unnecessary movements of the injured limb. Oral or parental NSAIDs were given to relieve the pain.

Lateral position with the patient lying on the unaffected side. The skin over the hip was scrubbed with povidone-iodine. The lower extremity from the groin to the toes was draped in sterile towels separately to enable easy manipulation of the limb during surgery.

Moore's Approach; From a point 10 cm distal to posterior superior iliac spine and extended distally and laterally parallel to the fibres of gluteus maximus to the posterior margin of the greater trochanter and then directed about 10 cm parallel to the femoral shaft. Deep fascia was exposed and divided in the line with the skin incision as also was the fascia over gluteus maximus, which was then split in the direction of its fibres using blunt dissection. By retracting the proximal fibres of the muscle proximally, the greater trochanter was exposed. Distal fibres are retracted distally and partly divided at their insertion into the linea-aspera in line with the distal part of the incision. The sciatic nerve was usually not exposed. It is protected with finger in the medial part of the wound and was gently retracted out of the way.

At follow up, detailed clinical examination was done systematically. Patients were evaluated according to Harris hip scoring system for pain, limp, the use of support, walking distance, ability to climb stairs, ability to put on shoes and socks ( in our study for some patients ability to cut toenail was enquired ) sitting on chair, ability to enter public transportation, deformities, leg length discrepancy and movements. All the details were recorded in the follow up chart. The radiograph of the operated hip was taken at regular intervals, at each follow up.

## Results

The following observations were made from the data collected during the study of treatment of intracapsular fracture neck of femur in elderly above the age of 50 years by hemiarthroplasty using either unipolar (AMP/Thompson's) or bipolar endoprosthesis in the Department of Orthopaedics.

In our series the maximum age was 90 years in case of males and 82 years in case of females. Most of the patients were in the age group of 50 - 70 years with the mean age of 65.33 years for males and 64.73years for females. In our series there were 26 female patients and 24 male patients this shows preponderance of females over males. Majority (84%) 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. Five patients were involved in road traffic accidents. Three of them were hit by vehicles, 2 fell down while riding the bicycle. Three patients had history of fall from moderate heights.

**Table 1: Distribution of sample by age and sex**

Age groups(in years)		Sex		Total
		Male	Female	
50-59	Frequency	6	7	13
	%	25.0%	26.9%	26.0%
60-69	Frequency	10	9	19
	%	41.7%	34.6%	38.0%
70-79	Frequency	5	9	14
	%	20.8%	34.6%	28.0%
80-89	Frequency	2	1	3
	%	8.3%	3.8%	6.0%
90-99	Frequency	1	-	1
	%	4.2%	-	2.0%
Total	Frequency	24	26	50
	%	100.0%	100.0%	100.0%

**Table 2: Descriptive statistics for the mode of injury of the sample selected**

Mode of Injury	Frequency	Percent
Fall	42	84.0
Fall (moderate height)	3	6.0
RTA	5	10.0
Total	50	100.0

One patient had hemiarthroplasty with Austin Moores prosthesis done four years back for the fracture neck of femur on opposite hip. He had slight pain in that hip and on radiograph there was loss of joint space reflecting acetabular erosion. There was no evidence of dislocation or sinking of prosthesis but there were radiolucent zones around of the prosthesis.

**Table 3: Distribution of the sample by Interval between trauma & hospitalization**

Interval between trauma & hospitalization	Frequency	Percent
less than 3 days	30	60.0
4-7 days	8	16.0
8-14 days	5	10.0
15-21 days	4	8.0
More than 21 days	3	6.0
Total	50	100.0

Thirty six patients were operated in the first week and 96% were operated within 2 weeks. Remaining patients had long pre-operative hospital stay because of their associated medical problems and were operated after treating and controlling the associated medical disorders by appropriate medications. The various complications observed in our series are as

follows: Apart from 2 deaths, 3 patients were lost for follow up. These 5 patients were excluded from the follow up study. Three patients had per prosthetic fracture of femur, one patient had bed sore and prosthetic dislocation. Two patients had developed bedsores in the second week after hemiarthroplasty.

**Table 4: Distribution of the sample by complications**

Complications	Frequency	Percent
Death	2	4.0
Peri prosthetic fracture	3	6.0
Bed sore + prosthetic dislocation	1	2.0
Superficial Infection	2	4.0
Bed sore	2	4.0
Nil	40	80.0
Total	50	100.0

Limp assessed in each patient and was scored accordingly. The number of patients in each category. Majority (66.2%) of the patients in our series had slight to moderate limp (66.2 %). In 31.1% of patients limp was not seen.

**Table 5: Distribution of the sample by Criteria of Limping**

Criteria	Score	equency	Percent
none	11	14	31.1
slight	8	19	42.2
moderate	5	11	24.4
severe	0	1	2.2
Total	10	45	100.0

The functional outcome after hemiarthroplasty for intracapsular fracture neck of femur was graded as excellent, good and fair after adding the scores given for each criterion for assessment of hip. In our series total Harris hip score at the end of six months ranged from 24 to 100. Fifteen (33.3%) hemiarthroplasties had hip scores from 91 to 100 (excellent). Fifteen (33.3%) had hip scores 81 to 90 (good). Nine hips (20%) were rated 71 to 80 (satisfactory) and six (13.3%) were rated 24 to 69 (poor). Thus 86.7% of the hips were classified as having a satisfactory to excellent result and 13.3% of the patients had a poor result.

### Discussion

The average age of our patients was 65.33 years in case of males and 64.73 years in case of females. Majority of the patients were between 51-70 years. The physiological age of our patients is more than the chronological age and hence these patients are considered old for all practical purposes. Similar age distribution is reported by other authors. Saxena & Saraf [7] (1978) had age distribution 45-90 years (Mean 66 years); Mukherjee & Puri [7] (1986) 65 years, Arwade (1987) 54-86 years with incidence between 70-80 years (Average 72 years). Bavadekar and Manelkar (1987) had mean age group in fresh fractures was 75 years whereas in old cases it was 62 years. Depending on the anteroposterior radiographic view available they were grouped into sub capital and transcervical type. In our series 74% patients had sub capital fracture and 26% had transcervical type of fracture. Klenerman and Marcuson (1970) defined subcapital fracture as the one that occurs immediately beneath the articular surface of the femoral head along the old epiphyseal plate and a transcervical fracture was referred to the fracture passing across the femoral neck between the femoral head and greater trochanter. Klenerman and Marcuson (1970) and Garden (1974)

suggested that this differentiation cannot be made distinctly in radiographs. Klenerman and Marcuson couldnot find transcervical fractures in their series and all were subcapital type on operation. All the fractures in our series belonged to displaced fractures of Garden Type III and IV. Depending on the anteroposterior radiographs available, we could group 32 patients (64%) into type III and 18 patients (36%) into Garden type IV. G.S. Kulkarni (1987) had grouped type III and type IV into one group of 'displaced fractures' and reported it in 82.5% of his patients. Sanchetti et al. (1987) reported 30% Garden type III and 22.5% Garden type IV in a series distributed between 20 to 80 years of age. Mukherjee & Puri [7] (1986) had 85% patients of Garden type III and IV fractures. Eighty four percent of our patients had trivial trauma and rest of the cases of fracture were due to severe trauma like fall from height or vehicular accidents. This is in accordance with majority of the series reported - [Gyepes (1962), Solomon (1968), Evarts (1973), Fielding (1974), Ingahalikar (1987), Seth (1987) etc.]. Stevens et al. (1962), Scott and Gray (1980), Urovitz et al. (1977), Colonel M.K. Seth (1987) and several other authorities believe that the intracapsular fracture are stress fractures through pathological bone secondary to osteoporosis or osteomalacia. The complications following the hemiarthroplasty for fracture neck of femur is reported in varying incidences. Moore (1957) [3] reported 16.6% mortality, Stinchfield and Cooperman (1957) [10] reported 4% dislocation, 6% fractures of the proximal femur. Temporary mental confusion was the commonest complication in the immediate post-operative period of Hinchey and Day (1964) series. Salvatti et al (1973) [11] reported 14.3% mortality, 8.3% superficial infection in their patients. C.M Robinson et al (1994) [12] reported 11% mortality within one year, 5% infection, 2% deep vein thrombosis and 3% dislocation in their series.



Periprosthetic fracture type-I



Periprosthetic fracture type-II



Preop X-ray



Postop X-ray 6months after

Gingras (1980)<sup>13</sup> and Whittaker<sup>14</sup> (1974) reported that the hip pain may be present with prosthetic loosening or proximal migration of the prosthesis. Sometimes there may not be radiographic changes.

Distal migration is best detected by comparing recent and earlier radiographs. Calcar resorption (Gingras) or a change in distance from the collar of the prosthesis to lesser trochanter (Whittaker) is suggestive of distal migration. Our results were comparable to other series.

### Conclusion

Hemiarthroplasty of hip for femoral neck fractures is a good option in elderly patients. The mortality and morbidity are not high, operative procedure is simple, complications are less disabling, weight bearing is early, early functional results are satisfactory and second operation is less frequently required.

We feel that the prejudiced attitude against the prosthesis only because of a metal replacing a bone appears to be unjustified.

### References

1. Mark F. Smiontkoski et Al. Current concepts review of intracapsular fracture of hip. JBJS. 1994; 76A: 129 -135.
2. Elizabeth O Johnson et Al. Vascular anatomy and microcirculation of skeletal zones vulnerable to osteonecrosis. Clinical Orthop. 2004; 35: 285-291.
3. Austin T. Moore: The self-locking metallic hip prosthesis. JBJS. 1957; 39A: 811-27.
4. Austin T. Moore and H.R. Bohlman: Metallic hip joint, a case report. JBJS. 1963; 25: 688- 92.
5. Bateman J. E: Single assembly total hip arthroplasty, preliminary report. Orthop Digest. 1974; 15:35-43.
6. Saxena P.S. and Saraf J.K. Moore Prosthesis in fracture neck of femur. Indian Journal of Orthopaedics. 1978; Vol 12: 138-145.
7. Mukherjee D.L. (Col), Maj. Gen. H.C. Puri. Early hemiarthroplasty for fresh fractures of the neck of the femur in geriatric patients. Indian Journal of Surgery. 1986; 48: 77-80.
8. Collins H.R. Replacement endoprosthesis in the treatment of the damaged hip, Orthop. Clin of the North America. 1971; 2: 75-91.
9. Seth M.K. (Col). Stress fractures of the neck of femur. Clinical Orthopaedics India. 1987; 1: 105-109.
10. Stinchfield F.E., Cooperman B. and Shea C.E. Replacement of the femoral head by Judet or Austin Moore Prosthesis. JBJS. 1957; 39A: 1043-1058.
11. Salvatti E.A., Wilson P.O. Long term results of femoral head replacements JBJS. 1972; 54A: 1355-1356.
12. C.M. Robinson, D. Saran and I.H. Annan: Intracapsular hip fractures: Results of management adopting treatment protocol. Cline Orthop. 1985; 160: 75 – 80.
13. Whittaker R.P., Aberhaus M.M., Scholl H.W. and Chung S.M.K. Fifteen years' experience with metallic endoprosthesis replacement of the femoral head for femoral neck fractures. J. Trauma. 1972; 12:799-806.
14. Whittaker R.P., Sotos L.N., and Raston E.L. Fractures of the femur about femoral endoprosthesis. J. Trauma. 1974; 14: 675-694.