

# Intracapsular Neck of Femur Fractures Managed by Bipolar Hemi- Arthroplasty-A Clinical Study

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**Abstract:** *Fracture neck of femur is one of the most common fractures in the elderly population and its incidence is on the rise because of increased longevity, sedentary habits and osteoporosis. Surgical management remains the mainstay of the treatment so as to avoid the complications associated with conservative management which include bed sores, deep vein thrombosis and respiratory infections. Bipolar hemiarthroplasty remains the best modality of management as it is associated with fewer complications and better functional result. This is a study of 35 patients having fracture neck of femur managed by bipolar hemiarthroplasty with a follow up ranging from 6 months to 36 months. The aim of this study was to demonstrate that bipolar hemiarthroplasty remains the procedure of choice for the management of fracture neck of femur in the elderly patients. Out Of the 35 patients 21 patients excellent result, 7 patients had good results, 6 patients had satisfactory result and 1 patient had poor result.*

**Keywords:** Bipolar Hemiarthroplasty, Harris Hip Score, Neck of Femur Fracture, Osteoporosis, Geriatric population

## 1. 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. Fracture neck of femur has been recognized since the time of Hippocrates and is a common orthopaedic problem in elderly [1]. The development in the management of femoral neck fracture parallels the historical development of orthopaedic surgery. Before the introduction of any internal fixation, this fracture was often the terminal event in the lives of many individuals. Smith Peterson nailing increased the rate of fracture healing, but 30 – 40% of fracture ended with either non union or avascular necrosis, in spite of careful nailing and stabilization [2]. This led to the principle of reduction by dynamic traction, the importance of anatomical reduction and its maintenance in plaster, the development of stable internal fixation devices and finally the development of hemiarthroplasty. Hemireplacement Arthroplasty - involves replacing the femoral head with a prosthesis whilst retaining the natural acetabulum and acetabular cartilage. Hemireplacement arthroplasty though not a perfect substitute for the natural head, yet restores joint function and fairly achieves the goals of treatment namely minimizing mortality and morbidity of the patients with effective rehabilitation which otherwise would have had disastrous complications of recumbency in the elderly.

## 2. Materials and Methods

The bipolar prosthesis was introduced by James.E.Bateman and Gilberty during 1974 [3, 4]. The provision of a completely mobile head element and the addition of another head surface for motion in the acetabulum create a compound system. This provides a greater distribution of bearing forces, thus minimizing wear and tear changes both on the implant and on the containing tissues. Such considerations were met initially by Bateman who designed a prosthesis of a cobalt-chromium alloy (Vitallium,

Howmedica), consisting of a femoral stem with a collar, neck, and a 22 mm spherical bearing at its proximal end. The spherical bearing is locked into a metallic cup or cap. i.e., the head which constitutes a second bearing surface which articulates with acetabulum. The bipolar prosthesis (Talwalkar Type) has got a stem length of 157mm, thickness is 8 mm and material for the stem is stainless steel AIS 316. The presence of fenestration in the stem is optional. It has a vertical shoulder which sits on the medial calcar, a long neck of length 35.0 mm, neck shaft angle of 125 degree and neck diameter is 19.00 mm. The diameter of the inner bearing is

26 mm. The inner bearing articulates with the inner surface of the outer cup or acetabular cup which articulates with the acetabulum. The inner surface of the acetabular cup is covered by High Density Polyethylene (HDPE) and the outer surface is of stainless steel AIS 316. The size of acetabular cup varies from 37-53mm.



**Figure 1:** Bipolar prosthesis

A total of 35 patients of either sex were included in this study aged 50 years and above.

**Inclusion criteria**

- 1) Displaced intra capsular fracture neck of femur.
- 2) Age >50 years.
- 3) Avascular necrosis of the femoral head secondary to fracture neck of femur.

**Exclusion Criteria**

- 1) Patients who were non ambulatory
- 2) Age <50 years.
- 3) Pathological fractures
- 4) Patients with additional acute lower extremity fractures in addition to the femoral neck
- 5) Patients who were medically unfit for surgery.
- 6) Patients not willing for surgery.

All patients on admission were subjected to initial management and resuscitation followed by a detailed history, clinical examination and relevant investigations (both pathological and radiological). In all patients pre operatively, ankle traction with an appropriate weight was given with the aim of relieving pain and reduces shortening. Ap radiographs of the affected pelvis in 15 degree internal rotation and cross table lateral radiographs were taken.

**2.1 Surgical Procedure**

After induction of either spinal or epidural anaesthesia the patient was placed on the lateral position on the operative table with the affected side facing up. Incision is made approximately 10cm distal to the posterior superior iliac spine and extended distally and laterally parallel to the fibres of gluteus maximus to the posterior margin of greater trochanter. The incision is directed distally 10-13cms parallel with femoral shaft. The proximal fibres of gluteus maximus are retracted proximally exposing the greater trochanter. The distal fibres are retracted distally. The sciatic nerve is identified and retracted carefully. The short external rotators are identified and stay sutures applied and exposing the capsule. The hip joint is opened by T shaped incision over posterior capsule. The thigh and knee are flexed to 90° and internally rotated to dislocate the hip joint. The head is extracted using an extractor or by using levers. The correct size of the prosthesis as determined by measuring the extracted head with measuring guage, then the stem of the prosthesis is placed in the proximal femur, impacted with 5 – 10° of anteversion till the collar is flush with calcar and reduced by traction, external rotation of the thigh and gentle manipulation of the head of the prosthesis into the acetabulum. Wound is closed in layers with suction drain in situ.

**3. Observation and Results**

A total of 35 cases of fracture neck of femur operated by bipolar hemiarthroplasty were followed up for a period ranging from 6 months to 36 months. The age of the patients were in the range of 53 years to 87 years with the mean age being 74 years. There was a female preponderance noted with the incidence being 68% in females. The left side(62%) was more affected than the right side(38%). Most common mechanism of injury was a simple trivial fall. Other mechanisms included RTA (Road traffic accident) and fall from height. Most common type of fracture was the sub

capital type (60%) and the trans cervical type accounted for the remainder (40%). Around 52 % of the patients had associated co morbid conditions like Diabetes mellitus, Hypertension, COPD, IHD. The mean stay of duration of the patients was about 16 days. All 35 patients were evaluated using modified HARRIS HIPSCORING system. By this system assessment was done under the following headings:

1. Pain
2. Limp
3. Use of support
4. Walking distance
5. Climbing of stairs
6. Put on shoes and socks
7. Sitting in chair
8. Enter public transportation
9. Deformities
10. Leg length discrepancy
11. Range of motion.

Out Of the 35 patients 21 patients(60%) had hip scores ranging from 91 to 100(excellent), 7 patients(20%) had hip scores ranging from 81 to 90 (good), 6 patients(17%) had hip scores ranging from 71 to 80 (satisfactory) and 1 patient(3%) had hip score <70%(poor).

**4. Conclusion**

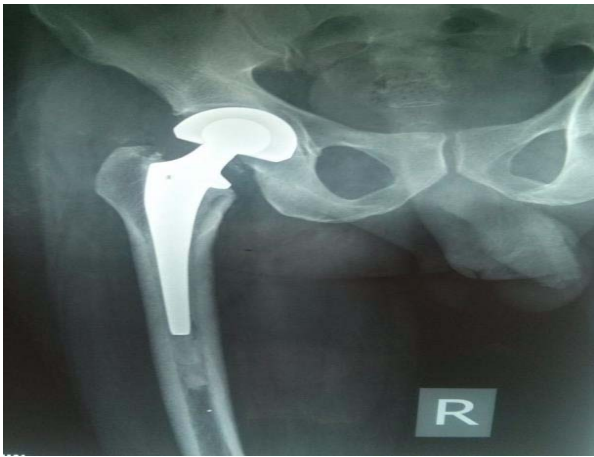
Fracture neck femur is very common in the geriatric population.. Progressive osteoporosis is believed to be the primary force driving the increased incidence of femoral neck fracture in elderly population. These patients were found to have a reduced bone mineral density. Another factor which is associated with this fracture is increased risk of falling in elderly population. Bipolar hemi arthroplasty is a safe procedure that can be performed in the elderly patients. It provides early mobilization, good relief of pain and good level of activities with minimal complications. Thus, with these results, we conclude that Bipolar hemiarthroplasty is the ideal treatment for intra capsular fracture neck femur.

**5. Case Reports****5.1 Case 1**

A 67 year old male patient with a history of road traffic accident



**Figure 1: Pre Operative Xray**



**Figure 2:** Immediate Post Operative X-ray



**Figure 3:** 1 YEAR FOLLOW UP

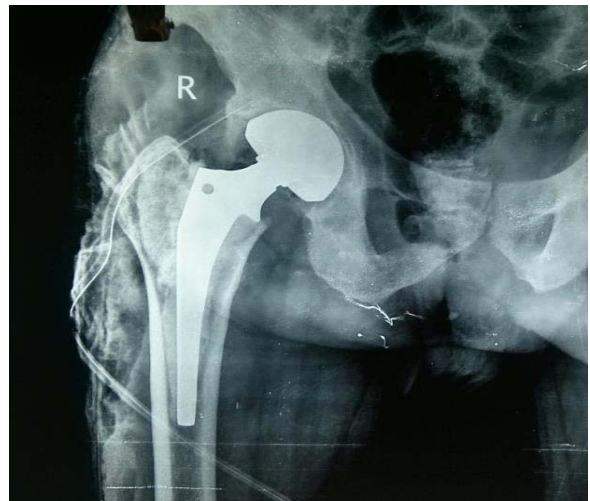


## **CASE 2**

A 70 year old male patient with a history of fall down at home.



**Figure 4:** Pre Operative X-ray



**Figure 5:** Immediate Post Operative X-ray





**Figure 6:** 1 Year Follow Up



## References

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## Author Profile



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