



“SURGICAL MANAGEMENT AND FUNCTIONAL OUTCOME OF INTRACAPSULAR FRACTURE NECK OF FEMUR WITH BIPOLAR HEMIARTHROPLASTY IN THE ELDERLY IN A TERTIARY CARE HOSPITAL: A PROSPECTIVE STUDY”

Orthopaedics

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KEYWORDS

INTRODUCTION:

Intracapsular fracture neck of the femur (ICNF) is one of the most common fractures of the hip joint. It has been increasing in the elderly. It is one of the most common injury causing morbidity and mortality in geriatric age groups. These fractures are frequently seen with age-related osteoporosis.

Among several other treatment methods for treating ICNF, hemiarthroplasty is considered more effective in treating ICNF in elderly patients.

The Austin-Moore and Thompson prosthesis were designed for older individuals with significantly less demand. The modular bipolar hip prosthesis with or without cement can give excellent results to the patients treated.

Most surgeons still prefer to do hemiarthroplasty as a primary procedure as it is always possible to do total hip replacement later. This study evaluates the outcome of bipolar hemiarthroplasty by assessing the quality of life and function in the operated limb.

This study also evaluates the efficacy of bipolar hip prosthesis in the management of ICNF where femoral head and neck replacement is done.

Currently, orthopaedic surgeons can choose between unipolar, bipolar, and total hip replacement in the treatment of intracapsular fractures in the elderly.

The problems with unipolar prosthesis are acetabular erosion and stem loosening.

Bipolar hemiarthroplasty of the hip was introduced by James E Bateman in 1974. The erosion and protrusion of the acetabulum would be less because motion is present between the metal head and polyethylene socket (inner bearing), as well as between the sealed metallic cup and acetabulum (outer bearing) since the cup is not fixed to the bone.

An added advantage was that the distribution of shear forces between the inner and outer bearings spares the acetabular surface from wear and erosion.

Principle of the Bipolar Prosthesis:

Acetabular wear is diminished through the reduction of the total amount of motion that occurs between the acetabular cartilage and metallic outer shell by the interposition of a second low-friction inner bearing within the implant; made available with a smaller 28 mm diameter head.

Aims And Objectives:

1. To evaluate the functional outcome of Bipolar hip prosthesis in the management of intracapsular fracture neck of femur in elderly.
2. To evaluate the pain, range of movement, and any complications following the surgery.

MATERIALS & METHODS:

- **Source of the study:** Santhiram Medical College & General Hospital, Nandyal.
- **Study design:** Prospective study.
- **Duration of study:** (6 Months) November 2023 to April 2024.
- **Sample Size:** 30 patients of either sex.

Method Of Collection And Study Population:

All patients aged more than 60 years coming to the orthopaedic department diagnosed as intracapsular neck of femur fractures at Santhiram Medical College and General Hospital, Nandyal. During the period November 2023 to April 2024.

Inclusion Criteria:

1. Patients of age more than 60 years
2. Patients who are willing to give informed written consent and willing to participate in the study.

Exclusion Criteria:

1. Patients of age less than 60 years
2. Patients who are not willing to give informed written consent and not willing to participate in the study.



Fig-1: Bipolar Prosthesis
Pre-op x ray:



Fig-2 Right Neck Of Femur Fracture
Post-op x ray:



Fig-3 Post Operative Bipolar Prosthesis

RESULTS:

Table No 1: Sex of the patient

Sex	No. of Patients	Percentage (%)
Male	14	46.67
Female	16	53.33
Total	30	100

In this study, out of 30 patients, 14 were male and 16 were female.

Table No 2: Size of prosthesis

Prosthesis size	Number of Patients	Percentage (%)
41mm	08	26.7
43mm	04	13.3
45mm	10	33.3
47mm	03	10
49mm	03	10
51mm	02	6.7
Total	30	100

In this study used prosthesis sizes varying from 41 mm to 51mm. Generally, size depends on the build of the patient.

Table No 3: Type of Fixation

Cemented/ Uncemented	No. of cases	Percentage (%)
Cemented	12	40
Uncemented	18	60
Total	30	100

Table No 4: Harris hip score

S. NO	Grade	NO. of cases	Percentage (%)
1	Excellent (90-100)	09	30
2	Good (80-89)	15	50
3	Fair (70-79)	04	13.3
4	Poor (<70)	02	6.7
5	Total	30	100

80% of the patients had an excellent to good Harris Hip Score while 13.3% of the patients had a fair result and 6.7% had poor results.

DISCUSSION:

The Intracapsular neck of femur fracture are relatively common injury among elderly individuals. To reduce morbidity and mortality, the aim of management should be towards making the patient mobile early. Bipolar hemiarthroplasty is advocated as the best modality of management of these fractures.

This is particularly applicable to the elderly age group where complications need to be prevented. The mean age of the patients in the present study was 65 years. The aim of assessing age is to estimate the patient's mean survival time and ability to comply with rehabilitation protocol.

In our study, majority of patients were females. The majority of our study patients (83%) sustained the injury due to trauma like slipping and falling on the ground. This is commonly seen in the elderly population due to decreasing vision.

All patients were operated after being put into lateral decubitus position by the posterolateral approach.

Our study had no late postoperative complications like loosening, dislocation, protrusion acetabuli, or periprosthetic fractures.

In our study, the final Harris Hip Score evaluated was at a maximum score of 93 and a minimum score of 65. Overall, 9 patients (30%) achieved Excellent results,

15 patients (50%) achieved good results, 4 patients (13.3%) achieved fair results and 2 patients (6.7%) achieved poor results. Overall, 80% of the patients achieved excellent to good results.

In our study, we are used more uncemented bipolar prosthesis. Some studies show better clinical ratings with uncemented Bipolars than cemented Bipolars¹. This is probably due to the absence of stress shielding of the proximal femur and near-physiologic transfer of stress to the medial femoral cortex.

There was no deterioration of results of Bipolar hemiarthroplasty over time; in short, it was proved in a study by Bochner & Pelicci². Our study also found no deterioration of the results for this study.

According to Merlo et al³, although protrusion was present radiologically, there was no clinically significant correlation. In our study, we have found no incidence of protrusion throughout this study. According to Lausten, Vedel et al⁴, acetabular protrusion and erosion have been reduced in Bipolar hemiarthroplasty, which is hence a good alternative to the unipolar prosthesis in fracture of the neck of the femur in the elderly and physiologically younger.

The proportion of good (50%) to excellent results (30%) in our study shows the efficacy of Bipolar hemiarthroplasty.

Polyethylene wear debris and metallosis, causing failure of bipolar hemiarthroplasty, were reported as isolated instances by Kim⁵ and Kobayashi et al⁶, respectively. We didn't see any of the above complications as our period of study is comparatively short. Dislocation/dissociation of Bipolar prosthesis is rare. However, in our studies, no dislocations are noticed.

Perioperative mortality was 1.31% (Lavernia C) to 4.6% (Nottage)⁷. In our study, there was no mortality.

Other complications like fracture of the polyethylene cup (Lavernia C)⁸ have not been observed in our study.

We have not observed any significant complaint of anterior or lateral thigh pain in the postoperative follow-up of our patients.

Revision rate in fractures of the neck of the femur treated by bipolar prosthesis was 6.5% according to Lavernia C⁸ and 10% according to La Belle⁹ over 7 years and 5 months. As our study is short, we have not noticed any cases that required revision surgery.

CONCLUSION:

This study concluded that bipolar hip prosthesis offers a reasonably good solution in patients with Intracapsular fractures in the neck of the femur.

The procedure has the following advantages:

1. It offers excellent, painless mobility, ease of rehabilitation, and return of function.
2. These results are better than other methods of treatment for intracapsular fracture neck of the femur.
3. Our results are comparable to other reports in the literature.
4. The durability of the implant and potential for preservation of the acetabular cartilage allow this prosthesis to be used in moderately active patients.
5. Very low complications when compared to unipolar prosthesis indicate the superiority of the implant.
6. It can be used as stop-gap surgery before Total hip replacement (THR).

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