

Unipolar vs bipolar hemiarthroplasty outcomes in geriatrics

Khaja Adil Ahmed¹, Mir Zia Ur Rahman Ali^{2*}

¹Assistant Professor, Department of Orthopaedics, Bhaskar Medical College, Yenkapally, Moinabad, Rangareddy, Telangana, INDIA.

²Orthopaedic Surgeon, Thumbay New Life Hospital, Malakpet, Hyderabad, Telangana, INDIA.

Email: drmirziaurrehman@gmail.com

Abstract

Background: A femur neck fracture and its complications are responsible for substantial morbidity and mortality. Unipolar and bipolar hemiarthroplasty assists in the patient's early mobilization and the prolongation of their productive life. **Objective:** Assess the clinical and radiological effects of unipolar and bipolar hemiarthroplasty in the femoral fracture of the intracapsular neck. **Design:** It is a Retro prospective study. **Duration:** One Year from January 2019 to December 2019. **Setting:** Department of Orthopedics. **Participants:** 50 Patients were selected divided into two groups 25 in each group based on Unipolar and Bipolar group. **Methods:** A retrospective research was conducted in 50 individuals with Unipolar (Austin Moore Prosthesis – 25 patients), Bipolar Prosthesis (25 patients) within a timespan of at least six months of hemiarthroplasty, and was studied for follow-up. Clinical evaluation was done pre-operatively and post-operatively at regular intervals using Harris Hip Score, which takes into account pain, function, deformity and range of motion. **Results:** Most patients who have been followed fall into the good to excellent category combined, which represents around 80% in Unipolar group and 84% in the Bipolar group which considerably more when compared to Unipolar group. Nearly everybody had a sedentary life style that required no effort. This was the most consistent finding in our series with good to excellent results. **Conclusion:** Our study results indicate that bipolar hemiarthroplasty produced better results clinically as well as radiologically compared to unipolar hemiarthroplasty.

Key Words: Unipolar, Bipolar, hemiarthroplasty, Femur, Fractures, Moore's prosthesis, Harris Hip Score

*Address for Correspondence:

Dr Mir Zia Ur Rahman Ali, Orthopaedic Surgeon, Thumbay New Life Hospital, Malakpet, Hyderabad, Telangana, India.

Email: drmirziaurrehman@gmail.com

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INTRODUCTION

The hip joint links the lower leg with the pelvic girdle. The multi-axial ball and socket joint allows the entire lower limb to pass into three mobility zones thus providing a significant damping role for the torso and upper body. Hip joint pain is one of the main causes of human locomotion disability. The paralytic pain in the hip can be treated by several techniques and procedures. Hemiarthroplasty is a

method of restoring mobility and flexibility to the tendon, ligaments and other components of the soft tissue that regulates the joint. The implantation of a broken femoral stem with an artificial one had such a profound social effect and had such a remarkable early success. Femoral intracapsular fracture neck is responsible for a significant proportion of elderly fractures.¹ The main objective of treatment is to return the individual to functional status before fracture. Prosthetic replacement facilitates rapid weight bearing to restore movement for patients and avoids recumbent and inactive complications.² Recent findings from RCTs now support the use of an arthroplasty in an elderly patient to treat a displaced femoral neck fracture.^{3,4,5} The recommendation to use a unipolar or bipolar prosthesis to perform hemiarthroplasty is still contentious, with proponents on both sides. Less acetabular wear and possibly less hip / groin pain are the benefits of bipolar prosthesis. Low costs and no chance of polyethylene wears debris are benefits of the unipolar prosthetics.⁶

MATERIALS AND METHODS

Place of Study: Department of Orthopedics

Type of Study: It is a Retro prospective study

Sample Collection: Sample size: 50 Patients divided into 2 groups Unipolar with 25 patients and 25 patients in Bipolar group

Sampling Methods: Consecutive Sampling

Inclusion Criteria: Patients above 50 years with Displaced intracapsular fracture of the neck of the femur, unilateral femur fracture.

Exclusion Criteria: Patients with neurological conditions, Poly trauma patients and Compound femur neck fractures were excluded from our study.

Statistical Analysis: Data were presented in the form of statistical Tables and charts. SPSS software version 20 was used for statistical analysis.

Ethical Approval: The consent was obtained from the Institutional Ethics Committee prior to the beginning of the study.

A retrospective research was conducted in 50 individuals with Unipolar (Austin Moore Prosthesis – 25 patients), Bipolar Prosthesis (25 patients) within a timespan of atleast six months of hemiarthroplasty, and was studied for follow-up. Clinical evaluation was done pre-operatively and post-operatively at regular intervals using Harris Hip Score, which takes into account pain, function, deformity and range of motion.

OBSERVATIONS AND RESULTS

Table 1: Distribution according to age and gender across unipolar and bipolar

Age Group(years)	No. of cases	
	UNIPOLAR	BIPOLAR
50-60	10 (40%)	10(40%)
61-70	8 (32%)	9 (36%)
71-80	7 (28%)	6 (24%)
Total	25	25
SEX		
Males	15 (60%)	16 (64%)
Females	10 (40%)	9 (36%)

Majority of the patients belonged to the age group of 50 – 60 years with 40% each in both the groups. And the least belonged to the age group of 71 – 80 years with 24 % in bipolar and 28% in unipolar. Males were predominant in both the groups with 60% in unipolar and 64% in bipolar respectively.

Table 2: Complications across both Unipolar and Bipolar groups

COMPLICATIONS	UNIPOLAR	BIPOLAR
Heterotopic Ossifications	1(4%)	1(4%)
Limb Length discrepancy	2(8%)	1(4%)
Sciatic nerve palsy	1(4%)	1(4%)
Periprosthetic fracture	2(8%)	1(4%)
Acetabular erosion	1(4%)	1(4%)

Both Limb Length discrepancy and periprosthetic fracture was majorly seen in Unipolar constituting 8% each. Heterotopic ossifications, Sciatic nerve palsy, acetabular erosion, Limb length discrepancy and periprosthetic fracture were seen the least in Bipolar group accounting 4% each.

Table 3: Distribution according to the neck shaft angle, Pain on follow up and satisfaction level while follow up

NECK SHAFT ANGLE	UNIPOLAR	BIPOLAR
	No. of patients %	No. of patients %
Neutral / Normal	16(64%)	20 (80%)
Valgus	2(8%)	1 (4%)
Varus	7(28%)	4 (16%)
Pain		
Mild pain	20 (80%)	22 (88%)
Moderate pain	4 (16%)	2 (8%)
Severe pain	1 (4%)	1 (4%)
Satisfaction		
Fully satisfied	20 (80%)	22 (88%)
Partly satisfied	05 (20%)	3 (12 %)
Unsatisfied	0	0

Approximately 80 % of the patients among bipolar group and 64% in the unipolar group have Normal Neck shaft angle.

The pain was mild in both the groups 80% in the Unipolar and 88% in the Bipolar group had Mild pain while follow up around 16% in the Unipolar group and 8% in the Bipolar group had moderate pain. Only 4% in both the groups had severe pain In case of bipolar 88% patients are satisfied and about 12% patient are partly satisfied and in Polar group 80% of the patients were fully satisfied and 20% of the patients were partly satisfied. among both of this groups on this parameter no significant differences present all the patient in both the groups were fully or partly happy with the treatment

Table 4: Modified Harris Hip Score (HHS)

Result	Score	UNIPOLAR	BIPOLAR
		No. Of Pt. %	No. Of Pt. %
Excellent	90-100	12 (48%)	15 (60%)
Good	80-89	8 (32%)	7 (24%)
Fair	70-79	5 (20%)	4 (16%)
Poor	< 70	0	0.00 %

Most patients who have been followed fall into the good to excellent category combined, which represents around 80% in Unipolar group and 84% in the Bipolar group which considerably more when compared to Unipolar group. Nearly everybody had a sedentary life style that required no effort. This was the most consistent finding in our series with good to excellent results.

DISCUSSION

Hemiarthroplasty may aid early ambulation's and functional rehabilitation because it is a technique effective for fractures for femoral neck and are progressively used by surgeons.⁷ Approximately 80 % of the patients among bipolar group and 64% in the unipolar group have Normal / Central Neck shaft angle. Varus was 28% in Unipolar group and 16% in Bipolar group. Valgus shaft angle was least in both the groups 8% in Unipolar and 4% in bipolar groups. A successful joint surgery should be painless, provide a wide range of movements and a stable hip. Pain is generally caused by one of two pathological processes following hemiarthroplasty : articular cartilage degeneration of the acetabulum, or prosthesis loosening. The reports of care for hemiarthroplasty in patients with femoral neck fractures were recorded by Anshu Shekhar *et al.* which were excellent in 43.5%, good in 38.4%, fair in 11.3% and poor 6.8% of the cases.⁸ Austin-Moore findings recorded in Dinesh Dhar *et al.*⁹ were excellent in 80.2% and fair 19.8% in femur neck fracture cases. In a study by Noor SS *et al.*,¹⁰ he reported excellent results in 38%, good in 21%, fair in 24% and poor in 17.3% of the cases. Most patients walk without mildly limping in the two patient classes without having any effect on the normal life style. Hudson *et al.*¹¹ found no statistically significant difference in mortality rates, surgical complications or others, including medical complications, in a eight-year study of ninety unipolar and 48 bipolar hemiarthroplasties. Cornell *et al.* conducted a retrospective six-month follow-up with thirty-three bipolar and fifteen unipolar hemiarthroplasties and observed no discrepancies in postoperative complications, time of hospitalizations, or hip results between the two patient classes.¹² This study suggests that bipolar hemiarthroplasty is better or stronger and is associated with improved functioning of hip, hip pain and longevity, and lesser costs when compared with Unipolar hemiarthroplasty and no significant differences in the operational period, blood loss, blood transfusion, hospital stay between Bipolar hemiarthroplasty and Unipolar hemiarthroplasty was found. Bipolar prosthetics with an extra inner joint have the potential benefits of less acetabular degradation and less dislocation compared with Unipolar hemiarthroplasty.

CONCLUSIONS

Hemiarthroplasty is an excellent technique in regards to recovery, pain reduction and returning function and functionality as close as possible to the pre-injury stage of the intra-capsular neck of a femur fracture. In contrast to unipolar hemiarthroplasty carried out on the Intra-Capsular neck for femoral fractures, the bipolar hemiarthroplasty gave better functional and radiological results in our study.

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