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Corresponding Author
V.H. Praveen Kumar,
Department Of Orthopaedics, Adichunchangiri institute of medical sciences, BG Nagara KMC, India

Author Designation
[1]Professor
[2,3]Junior Resident

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Comparative Study Between Modular Bipolar Prosthesis vs Bipolar Prosthesis in Management of Fracture Neck of Femur

[1]D.V. Mahesh, [2]V.H. Praveen Kumar and [3]Dharshanik Suresh
[1]Department of Orthopaedics, Adichunchangiri institute of medical sciences, BG Nagara, India
[2,3]Department Of Orthopaedics, Adichunchangiri institute of medical sciences, BG Nagara KMC, India

Abstract
Fracture neck of femur are common injuries. Femoral neck fractures are intracapsular fractures. Femoral neck connects the shaft to the head of the femur. The hip joint is the articulation of femoral head to the acetabulum. The junctional location makes it more prone for fractures. The present study is on the functional outcome of fracture neck of femur in the elderly patients. There are various complications followed by hemiarthroplasty such as wound infection, implant loosening, dislocations, periprosthetic fractures, thromboembolism, limb length discrepancy, joint stiffness. Bipolar replacement resulted in a higher percentage of satisfactory results, less postoperative pain, greater range of movement, more rapid return to unassisted activity, fewer unsatisfactory results and no acetabular erosion. This study suggest that the utilization of modular bipolar prostheses in hemiarthroplasty for fracture neck of femur, especially in elderly patients, could lead to superior functional outcomes compared to non-modular bipolar prostheses.

INTRODUCTION

- Fracture neck of femur are common injuries. Femoral neck fractures are intracapsular fractures.
- Femoral neck connects the shaft to the head of the femur.
- The hip joint is the articulation of femoral head to the acetabulum. The junctional location makes it more prone for fractures.
- Hip fractures are common injuries, especially seen in the elderly people . It is also seen in young patients who perform in athletics or high-energy trauma. Immediate diagnosis and management are required to prevent threatening joint complications.
- The main objective of treatment of fractures with internal fixation is to avoid the fracture displacement and maintain the fracture reduction at earliest. But reasons for failure of internal fixation of fracture neck of femur especially in elder patients are avascular necrosis and non union and leading to need of reintervention in many cases.
- Therefore fracture neck of femur are usually treated surgically and hemiarthroplasty is the most common procedure in elderly patients which improves the quality of life and routine activity for the patients.
- The proximal femoral hemiarthroplasty prosthesis were made of a single casting [unipolar] in which femoral stem is attached to the femoral neck and head. But modern hemiarthroplasties are modular with various combinations of stem , neck length , head.
- This is short term prospective study to compare the functional outcome of modular bipolar prosthesis and non modular bipolar prosthesis used in hemiarthroplasty in fracture neck of femur especially in elderly patients. The outcomes were measured at 3 months, 6months, 9months and 1 year and compared using Harris hip score.
- Major fracture specific risk associated with this injury is non-union and avascular necrosis of femoral head[1].

MATERIALS AND METHODS

The present study is on the functional outcome of fracture neck of femur in the elderly patients treated with non modular and modular bipolar prostheses.

Patient selection., The 23 patients with age range of 60-90 years who were presented to the Adichunchangiri institute of medical sciences[AIMS] Out patient department with displaced fracture neck of femur from January 2022 to July 2022.

Inclusion Criteria Considering the Following Factors:

- Patients with age group >60years.
- Patients with unilateral fracture neck of femur. with no evidence of previous contralateral fracture neck of femur.
- Patients with DOR type A.
- Patients who were medically fit for surgery

Exclusion Criteria Considering Following Factors:

- Patients with age group<60 years.
- Patients with previous history of contralateral neck of femur fracture.
- Patients with other lower limb fractures along with fracture neck of femur.
- Pathological fractures.

Surgical Procedure: All the patients were operated through southern moore approach. Out of 23 patients 14 patients underwent nonmodular bipolar hemiarthroplasty [group A] and 9 patients underwent modular bipolar hemiarthroplasty [group B].

Post Operative Management: Postoperatively patients were given with adequate antibiotics. Postoperatively patients were made full weight bear from pod 2 to pod5 based on the patient comfortability. Regular sterile wound dressing done and discharged on the basis of wound recovery.

Outcome Measures: And were followed up at 1month, 3 months , 6months, 9 months and 12 months. And were assessed with HARRIS HIP SCORE at respective follow up period.

RESULTS AND DISCUSSIONS

A total of 23 patients undergone surgery. Out of which group A has 14 members and group B has 9 patients. One patient in group A died due to cardiac arrest and 1 patient from each group lost the follow up. And totally 12 patients from group A and 8 patients of group B left out for the regular follow up.

Complications: There are various complications followed by hemiarthroplasty such as wound infection, implant loosening, dislocations, periprosthetic fractures, thromboembolism, limb length discrepancy, joint stiffness.

In our patients groups most of the patients didn't had any complications. 1 patient of each prostheses had surgical site superficial infection which was managed by debridement and secondary suturing and wound recovered well.

One patient of non modular prosthesis had history of retrauma after 10 months of surgery and had periprosthetic proximal femur shaft fracture and managed by internal fixation long LCDCP and ss wire and mobilized with walker later after 6 weeks.

Statistical Results: The statistical results of 19 patients with regular follow up were considered. The harris hip score was done for all the patients at 1month, 3 month, 6 month, 9 month, 12 month. The Harris Hip score for non modular bipolar prosthesis cases at 1month, 3 month , 6 month, 9 month, 12 month was 58.4+/-11.2, 65.32+/-13.5, 69.5+/-14.2, 73.8+/-14.8, 78.6+/-15.7.

Fig. 1: Non modular bipolar prostheses

Fig. 2: Modular bipolar prostheses

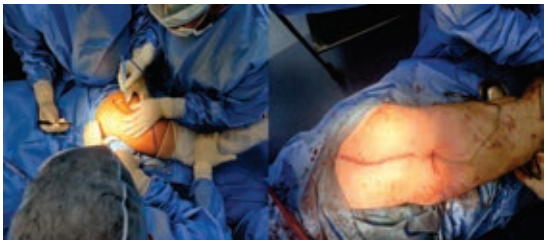

Fig. 3: Surgical approach

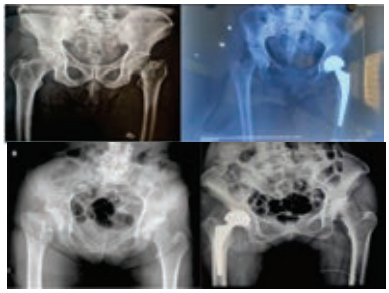

Fig. 4: Modular bipolar prostheses

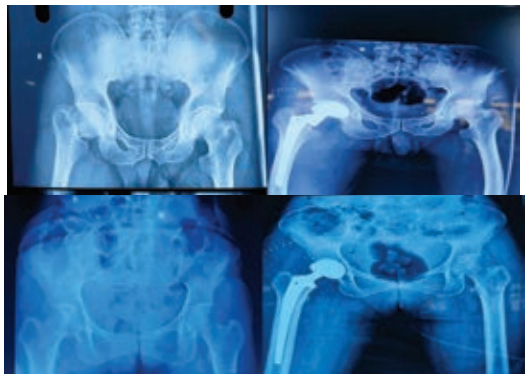

Fig. 5: Non modular bipolar prostheses

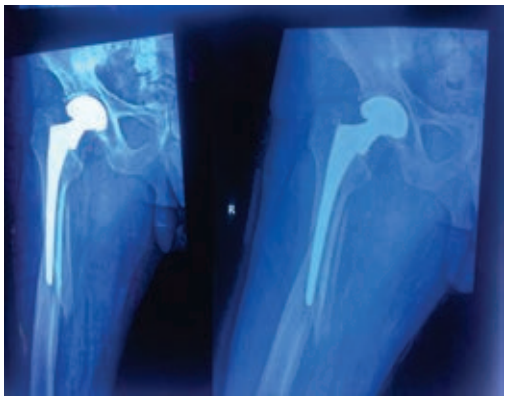

Fig.6: PRE-op Xray

Fig.7: Post-op xray

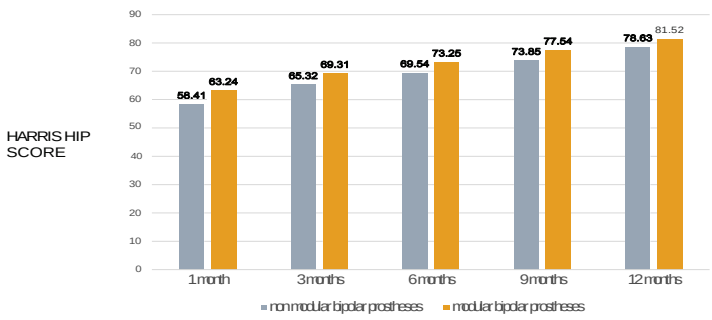

Fig.8: Harris hip score

Table 1:

		GROUP A	GROUP B
Age[average]		67.8	64.5
Gender	MALE	9	6
Female		5	3
Side	LEFT	6	5
Right		8	4
CO-morbidities	YES	10	7
NO		4	2
Mode of injury	TRIVIAL FALL	13	9
RTA		1	0
Garden classification	2	7	5
	3	5	3
	4	2	1

Table 2:

Follow up months	Non modular bipolar prostheses Hip score (Mean+/-SD)	Modular bipolar prostheses hip score (Mean+/-SD)
1	58.41+/-11.2	63.24+/-11.8
3	65.32+/-13.5	69.31+/-12.1
6	69.54+/-14.2	73.25+/-12.8
9	73.85+/-14.8	77.54+/-13.4
12	78.63+/-15.7	81.52+/-15.9

Table 3: Harris hip score

Pain		**Functional/ Stairs**	
None	44	Normal	4
Slight, occasional	40	Normal with bainster	2
Mild, normal activity	30	Any method	1
Moderate, Activity concessions	20	Unable	0
Marked, severe concessions	10		
Totally disabled	0		
Range of motion (ROM)		**Socks and shoes**	
Full	5	Easy	4
Partial	4	with difficulty	2
Limited	2	Unable	0
Gait/limp		Sitting	
None	11	Any chair 1 hour	5
Slight	8	Unable to sit ½ hour	3
Moderate	5	High chair ½ hour	0
Unable to walk	0		
Gait /support		Public transport	
None	11	Able	1
Cane for long walks	7	Not able to use	0
Cane, full time	5		
Crutch	4		
Two canes	2		
Unable to walk	0		
Gait distance		**Deformity+**	
Unlimited	11	Absence of all 4	4
6 blocks	8	Presence of 1	0
2 or 3 blocks	5		
Indoors only	2		
Bed and chair	0		
		Total score	/100

The Harris hip score in patients with modular bipolar prosthesis is 63.2+/-11.8, 69.3+/-12.1,73.2+/-12.8, 77.5+/-13.4, 81.5+/-15.9 at follow ups 1,3 ,6, 9,12 months.

At every follow up it has been found that Harris hip score of modular bipolar was more than the non modular group of patients.

The findings of this study offer compelling insights into the potential benefits of utilizing modular bipolar prostheses in hemiarthroplasty for fracture neck of femur, particularly within the context of elderly patients. The evidence presented suggests that the implementation of modular bipolar prostheses is associated with notably improved functional outcomes when contrasted with non-modular bipolar prostheses.

Bipolar replacement resulted in a higher percentage of satisfactory results, less postoperative pain, greater range of movement, more rapid return to unassisted activity, fewer unsatisfactory results and no acetabular erosion[2].

These results underscore the potential clinical advantages of employing modular prostheses, which could translate into enhanced postoperative mobility, reduced pain and improved quality of life for elderly patients undergoing hemiarthroplasty. The inherent adaptability and customizable nature of modular prostheses seemingly provide a platform for tailoring interventions to the unique anatomical characteristics of each patient, thus contributing to their potential superiority in optimizing functional recovery.

Its advantages are reduced stress at the bone-implant interface, greater stability and lesser risk of protrusio acetabulae[3].

Limitations of the Study: However, it's important to acknowledge the limitations of this study, notably the relatively limited sample size and the relatively short duration of follow-up. The complex nature of medical interventions, coupled with patient-specific variables, necessitates a cautious interpretation of the observed results. To solidify and generalize these findings, further investigations with larger and more diverse patient cohorts, encompassing extended follow-up periods, are warranted.

CONCLUSIONS

This study suggest that the utilization of modular bipolar prostheses in hemiarthroplasty for fracture neck of femur, especially in elderly patients, could lead to superior functional outcomes compared to non-modular bipolar prostheses. However, further research with larger sample sizes and longer follow-up periods would be valuable to corroborate and deepen our understanding of these results.

REFERENCES

1. Khan, A.Q., J. Mohammad, R. Qamar, Y.S. Siddiqui, A.B. Sabir and M. Abbas, 2021. Cemented unipolar or modular bipolar hemiarthroplasty for femoral neck fractures in elderly patients-which is better. Int. J. Burns Trauma., 11: 447-455.
2. Malhotra, R., R. Arya and S. Bhan, 1995. Bipolar hemiarthroplasty in femoral neck fractures. Arch. Orthop. Trauma Surg., 114: 79-82.
3. Kumar, V.S., P. Saiprasad and B.U. Subash, 2023. Cemented bipolar hemiarthropla sty-an analysis of functional outcome. Int. J. Acad. Med. Pharm., 5: 1644-1646.