

Early functional outcome: A comparison between Bipolar and unipolar hemiarthroplasty

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ABSTRACT

Objective: To compare the functional outcome of Bipolar and unipolar hemiarthroplasty (HA) treatment for neck of femur fracture in elderly population.

Methods: This was a randomized study, conducted from January 2014 to May 2015. All the patients were sixty years and above with Garden type III and IV Neck of femur fracture. The patients were randomly placed in two groups. Group A were treated with bipolar and B with unipolar Austin Moor (AM) hemiarthroplasty (HA). Non-weight bearing mobilization on 1st postoperative day. Weight bearing with crutches on 3-5th postoperative day. Early outcome was assessed at 3 months follow-up, using Harris hip score.

Results: Thirty patients were divided into two groups, i.e., 15 in each. Patients in group A have returned to daily living activities earlier than patients in group B. Group A has 87% (n=13) excellent, 13% good with no fair and poor results while group B has 53% excellent, 33% good and 13% fair results.

Conclusion: Bipolar hemiarthroplasty is an effective treatment for neck of femur fractures in elderly population with excellent functional outcome in majority of the patients.

Key words: Austin Moor, bipolar hemiarthroplasty, neck of femur fractures.

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INTRODUCTION

Femur neck fractures are among the commonest injuries in elderly population treated by orthopaedic surgeons.¹ These are low energy injuries, therefore mostly closed injuries. In elderly patients, Hemiarthroplasty is the treatment of choice for displaced femoral neck fractures.^{2,3}

The hemiarthroplasty, depending on the articulation of the prosthesis, unipolar and bipolar. Unipolar's head articulated directly with the acetabulum, whereas the bipolar's head has a polyethylene liner between smaller and larger prosthetic head. Bipolar prosthesis causes less acetabular erosion, which is associated with pain and impaired function of the hip.^{4,5}

This study was planned to compare the functional outcome of femur neck fractures in elder population treated by unipolar and bipolar hemiarthroplasty, using Harris hip score.¹

METHODS

This randomized study was conducted from January 2014 to May 2015. It comprised elderly patients aged 60 years and above, with femoral neck fractures. Closed Garden⁶ Type III and IV femoral neck fractures were included (Fig 1). Patients with Garden type I and II, previously diagnosed Cerbero vascular diseases, osteomalacia, pathological and open fractures were excluded. Skin traction applied initially for the pain management.

Patients were divided into two groups A and B. Bipolar hemiarthroplasty was performed in group A patients. Unipolar (Austin Moor) hemiarthroplasty was done in group B patients (Fig 2). Standard Modified Hardings approach was used for exposure⁷. The hip range of motion was assessed peroperatively after reduction of HA prosthesis.

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Postoperatively, patient lying supine with abduction pillow between the legs. On bed mobilization started on next postoperative day. Assisted weight bearing allowed on 3rd to 5th post operative day.

Follow up was performed at 2nd, 4th 12th and 24th weeks upto 1 year. Ambulatory status, range of motion and wound site infection were assessed at each visit. Early outcome was recorded at 3 months follow up using Harris hip score. Data was analyzed using SPSS version 17.0

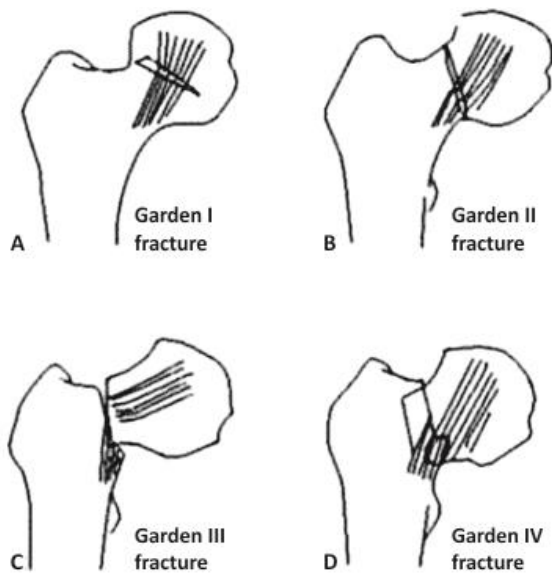


Fig. 1: Garden classification of neck of femur

RESULTS

This study included thirty patients. Fifteen (50%) in each group. The mean age was 65 ± 2.47 (SD) years in group A and 72 ± 4.19 (SD) years in group B. Females were more frequently involved than males in both groups as shown in Table I.

Group A had 87% excellent and 13% good result. There was no fair and poor outcome in group A. While in group B, 53% were excellent, 33% good, and 13% fair result as shown in Table II.

Table 1: Demographic Data

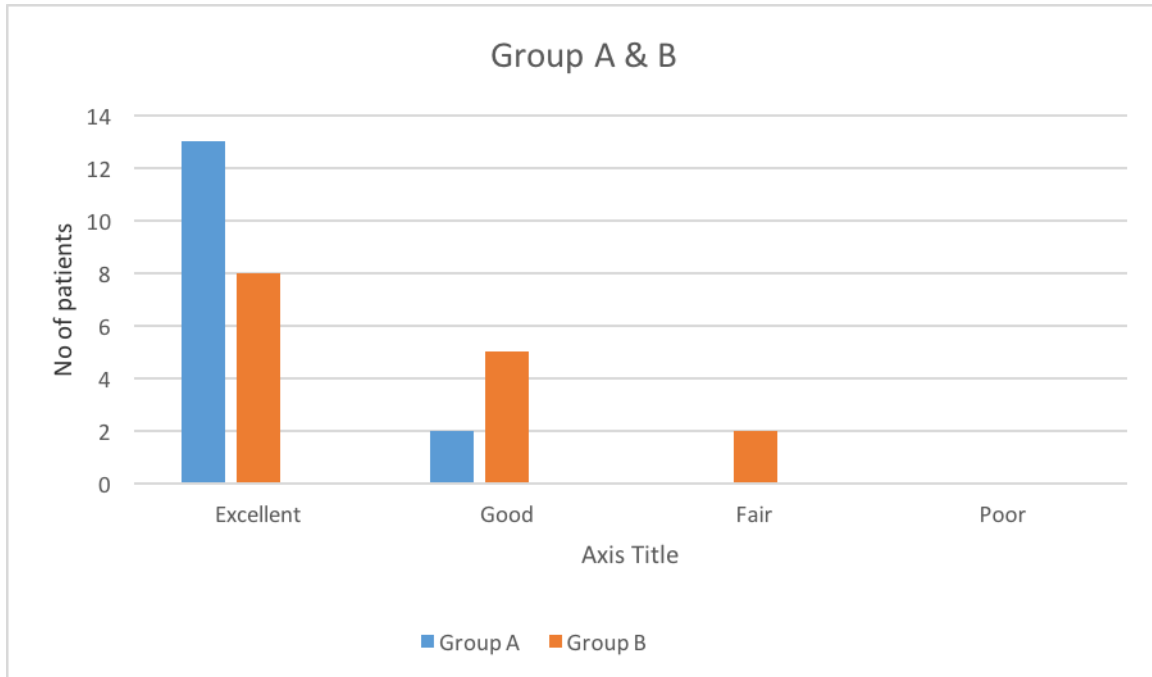
Group A	Sex	Frequency	Percentage
	M	5	33%
	F	10	67%
Ratio 1:2			
Group B	M	3	20%
	F	12	80%



Fig 2: Pre and post op x rays of Bipolar and AMP.

	Ratio 1:4
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Table 2: Outcome



DISCUSSION

This was a randomized study, aimed to assess the functional outcome of displaced femoral neck in elderly, treated with unipolar or bipolar femoral neck prosthesis.

To avoid the effect of prolonged immobilization, the prosthetic replacement has gained popularity for the treatment of femoral neck fractures in elderly population.^{8,9} The decision of HA over internal fixation in the treatment of displaced femoral neck fracture is superior because it eliminates the risk of nonunion, malunion and osteonecrosis. It also allows early weight bearing and rehabilitation.^{5,10}

Our randomized trial has shown better results were obtained by using a bipolar hemiarthroplasty at 3 months follow up. The bipolar HA is superior to Unipolar HA in respect of better range of motion and less acetabular wear.¹¹ A comparison in 2010 cochrane report on arthroplasties for the treatment of displaced femoral neck fracture shows a decreased risk of acetabular erosion in bipolar HAs as compared to unipolar.¹² In the short-term result unipolar hemiarthroplasty do well, with low rates of infection and dislocation. Acetabular erosion is the most important complication of unipolar HAs, that requires total hip arthroplasty(HA).¹³

Malhotra¹⁴ suggested that bipolar HA provided greater range of motion, less pain and a lower rate for revision surgery as compared to unipolar HA. Raia¹⁵ found no significant difference between uni and bipolar HAs at 1 year follow up.

Our study has short term follow up. We found that bipolar HA is a better option over unipolar HA. A long term follow up is required to settle the debate. The authors of 2004 cochrane review concluded that there was no significant difference between uni and bipolar HAs for dislocation, acetabular erosion, reoperations, deep vein thrombosis or mortality.¹² The recent literature favors total hip arthroplasty in active and healthy elderly patients of femoral neck fractures.¹⁶

Small sample size and short follow up period are the two main limitation of our study. We recommend further studies to address these limitations.

CONCLUSION

Bipolar hemiarthroplasty is an effective treatment for neck of femur fractures in elderly population with excellent functional outcome in majority of the patients. Our study shows that the bipolar hemiarthroplasty is stable, less painful and favors early mobilization as compare to unipolar hemiarthroplasty.

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Authorship and Contribution Declaration

Syed Amir Jalil, Conception and design, acquisition of data

Muhammad Naseem, interpreted the data

Rahat Moton, Drafted the manuscript

Muhammad Imran Javed, Revised the manuscript critically for important intellectual content

Rajab Ali Mughal, Final approval of the version for publication