

# Cemented Bipolar Hemiarthroplasty Better than Austin Moore Hemiarthroplasty for Treatment of Fracture Neck of Femur – is this True?

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## ABSTRACT

**Aims:** To analyze the outcomes of Hemiarthroplasty with Cemented Bipolar and Austin Moore for the treatment of femoral neck fractures and compares the results by Harris Hip Score system

**Study design:** Prospective/observational study.

**Place and duration:** Dept of Orthopedic, Sh. Zayed Hospital, Lahore from 01-01-2018 to 30-06-2018.

**Methods:** In this study, we included 60 elderly patients of both genders of confirmed femoral neck fractures by clinical examination. Patient's ages were ranging from 59 to 85 years. After taking informed consent from all the patients, patient's detailed medical history including age, sex was taken. Patients were examined in detail. X-rays of pelvis with both hip joints were taken. All fractures were graded according to Garden Classification of femoral neck fractures. All the patients were divided into two groups, Group A treated with Austin Moore Hemiarthroplasty and Group B with Cemented Bipolar.

**Results:** Out of all 60 patients, 42(70%) patients were males while rest 18 (30%) were females. 35(58.3%), patients were ages between 59 to 69 years, 15(25%) patients were ages 70 to 79 years and 10(16.7%) patients had ages > 79 years. Each group had 30 patients in which 21(70%) patients were males and 9(30%) patients were females in both groups. Mortality rate was 13.3% in Group A while in Group B it was 10%.

**Conclusion:** It is concluded that Cemented Bipolar Hemiarthroplasty had better results with respect to HSS system, complications and mortality rate than compared to Austin Moore Hemiarthroplasty.

**Keywords:** Cemented Bipolar, Austin Moor, Hemiarthroplasty, Femoral Fracture

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## INTRODUCTION

Femur neck fracture is one of the most common orthopaedic injury with high rate of morbidity and mortality in elderly age patients<sup>1</sup>. This injury is mostly found in elderly age patients having ages more than 50 years and the estimation of 97% prevalence in this age group. The occurrence of hip fractures has been increasing as fifty five per cent and in the next 40 years, the number of high risk patients is expected to be doubled<sup>2</sup>. In un-displaced fractures, there is a high rate of nonunion and osteonecrosis 5% and 10%, respectively while in displaced fractures the rate of nonunion and osteonecrosis is 10 to 30% and 15% to 33% respectively<sup>3,4</sup>. There is a high rate of complications in non-ambulant elderly age patients in those having non-operative treatment<sup>5</sup>. Various surgical techniques are used for the treatment of fracture neck of femur such as lag screw, Hemiarthroplasty with Austin Moore, Cemented Thompson and Cemented Bipolar and Total Hip Replacement and Sliding Hip Screw<sup>6,7</sup>. Hemiarthroplasty show better outcomes when compared to internal fixation in elderly age patients with respect to non-union and osteonecrosis<sup>8,9</sup>. Hemiarthroplasty for the treatment of fracture of neck femur is a more immense surgical treatment than the internal fixation. In Hemiarthroplasty, Austin Moore Prosthesis contains advantages such as lesser blood loss, less post-operative complications and less operative time<sup>10</sup>. The disadvantages of Austin Moore Prosthesis included sinking of femoral

stem, increase rate of acetabular erosion and high rate of thigh pain after operation<sup>11-13</sup>. Cemented Bipolar Hemiarthroplasty has advantages of early mobilization and less thigh pain after surgical treatment. The disadvantage of Cemented Bipolar Prosthesis includes more immense operation compared to Austin Moore Prosthesis and it is more expensive treatment than AMP. One of the most important advantages of Bipolar Prosthesis is movement between inner and outer bearing; but it is seen that inner bearing motion decreases over a period of time. There is also the risk of osteolysis around the stem due to poly wear particles<sup>14,15</sup>.

This study was conducted to analyze the outcomes of Hemiarthroplasty of fracture of femur neck with Austin Moore Prosthesis and Cemented Bipolar Prosthesis to compare the outcomes in both. This study will help to provide better treatment option to the affected patients.

## MATERIAL AND METHODS

This study was conducted at Department of Orthopedic, Sheikh Zayed Hospital, Lahore during period from 1<sup>st</sup> January 2018 to 30-06-2018. In this study, we included 60 elderly aged patients of both genders having confirmed femoral neck fracture by clinical examination and X-rays. Patient's ages were ranging from 59 to 85 years. After taking informed consent from all the patients, patient's detailed medical history including age, sex was taken. Patients were examined in detail. X-rays of pelvis with both hip joints were taken. All fractures were graded according to Garden Classification of femoral neck fractures. Prophylactic antibiotics were given. All the patients were divided into two groups, Group A treated with Austin Moore

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Hemiarthroplasty and Group B with Cemented Bipolar. Each group contained 30 patients. Postoperatively patients were mobilized on 1<sup>st</sup> or 2<sup>nd</sup> post operative day with the help of crutches or walker, along with range of motion exercises and quadriceps strengthening exercises. All the patients were discharged within 3 to 5 days after operation. For removal of suture follow-up was taken at 2 weeks after surgery. Complete follow-up was taken at period of 6 months after operation to compare the outcomes, complications and the mortality rate. All the outcomes were compared with HHS (Harris Hip Score) system. Post-operative complications were noted and compared with both groups. All the statistical data was analyzed by using statistical software SPSS-20.

**RESULTS**

Out of all 60 patients, 42(70%) patients were males while rest 18(30%) were females. 35(58.3%) patients were aged between 59-69 years, 15(25%) patients aged 70-79 years and 10(16.7%) patients were >79 years of age. Patients divided into two groups, each group had 30 patients. There were 21(70%) males and 9(30%) were females in both groups. There were 5(16.67%) patients with Garden Type II in both groups, in group-A 18 (60%) patients and in group-B, 20(66.66%) patients had Garden Type III while 7(23.33%) patients in group-A and 5(16.67%) of group-B had Garden Type IV. Mortality rate was 13.3% in Group A during follow up period while in Group B it was 10%. Outcomes after complete 6 month follow-up was noted as excellent, good, fair and poor in Group A 2(7.69%), 9(34.62%), 8(30.77%) and 7(26.92%) patients respectively. In Group B there were 3(11.11%), 9(33.33%), 9(33.33%) and 6(22.22%) patients as excellent, good, fair and poor respectively. Complications were noted as comorbidities, wound infection and implant infection in 16(61.53%) patients, 4 (15.38%) patients and 4(15.38%) patients respectively in Group A while in Group B there was 10(37.03%), 2(7.41%) and 3(11.11%) patients, respectively. Pain score at final 6 month follow up in Group A and Group B was noted as Grade I, II, III and IV in 2, 5, 15, 4 and 3, 10, 12 and 2 patients, respectively.

Table 1: Demographically details of all the patients

Variable	No.	%
<b>Gender</b>		
Male	42	70.0
Female	18	30.0
<b>Age (years)</b>		
59-69	35	58.3.0
70-79	15	25.0
> 79	10	16.7

Table 2: Group wise distribution of patients

Gender	Group A	Group B
Male	21 (70%)	21 (70%)
Female	9 (30%)	9 (30%)

Table 3: Distribution of fracture pattern and method of fixation.

Fracture pattern	Group A	Group B
Garden Type II	5 (16.67%)	5 (16.67%)
Garden Type III	18 (60%)	20 (66.66%)
Garden Type IV	7 (23.33%)	5 (16.67%)

Table 4: Mortality rate in both groups

Mortality	Group A	Group B
Yes	4 (13.33%)	3 (10%)
No	26 (86.67%)	27 (90%)

Table 5: Harris Hip Score results after 6 months follow-up

Harris Hip Score	Group A	Group B
Excellent	2 (7.69%)	3 (11.11%)
Good	9 (34.62%)	9 (33.33%)
Fair	8 (30.77%)	9 (33.33%)
Poor	7 (26.92%)	6 (22.22%)

Table 6: Post-operative complications

Complications	Group A	Group B
<b>Comorbidities</b>		
Found	16 (61.53%)	10 (37.03%)
Not Found	10 (38.46%)	17 (62.96%)
<b>Wound Infection</b>		
Found	4 (15.38%)	2 (7.41%)
Not Found	22 (84.62%)	25 (92.59%)
<b>Implant Infection</b>		
Found	4 (15.38%)	3 (11.11%)
Not Found	22 (84.62%)	24 (88.89%)

Table 7: Pain score at complete follow up (6 months)

Pain	Group A	Group B
Grade I	2 (7.69%)	3 (11.11%)
Grade II	5 (19.23%)	10 (37.04%)
Grade III	15 (57.69%)	12 (44.44%)
Grade IVs	4 (15.38%)	2 (7.41%)

P-Value 0.136

**DISCUSSION**

Rapid restoration of pre-injury functional and ambulatory status of elderly patients with fracture neck of femur is the ultimate objective with any treatment. Hemiarthroplasty is the most common performing procedure for the treatment of fracture neck femur in patients having age >50 years. There is no significant proof regarding the type of arthroplasty to be chosen in fracture neck of femur in elderly patients. However, cemented arthroplasty do well with regard to postoperative pain, mortality and complications<sup>16</sup>.

In this study, out of all 60 patients, 42(70%) patients were males while rest 30% were females. These results show similarity to the study conducted by Balaji regarding Hemiarthroplasty with Cemented Bipolar and Austin Moore, In which rate of males patients population was high as compared to females and reported 73% and 25%.<sup>17</sup> We found that 35(58.3%) patients were aged between 59-69 years, 15(25%) patients 70-79 years and 10(16.7%) patients > 79 years of age.

A study conducted by Balaji et al<sup>18</sup> reported that the prevalence of fracture neck femur was high in patients having ages 50 to 65 years. Our study shows similarity, in which maximum numbers of patients were ages 59 to 69 years. In our research, there were 10(16.67%) patients in Garden Type II, 32(53.33%) patients in Garden Type III and 18(30%) patients in Garden Type IV. According to the fracture type 5 patients in Type I, 18 patients in Type II and 7 patients in Group A while 5, 20 and 5 patients as Type II, III and IV in Group B.

In this study, the outcomes after complete follow-up was noted as excellent, good, fair and poor in Group A

(treated with Austin Moore Prosthesis) as 2, 9, 8 and 7 patients respectively. In Group B (Cemented Bipolar Prosthesis) there were 3, 9, 9 and 6 patients as excellent, good, fair and poor. We observed no major difference in both groups. Many of studies illustrated that no major difference was found with respect to final outcome at 6 and 8 months follow-up with respect to HHS system<sup>19,20</sup>. We observed a significant difference with respect to complications in both groups. This may be due to the procedural methods or surgeons experience. Hemiarthroplasty requires expertise for better outcomes and lesser complications<sup>21</sup>. Pain score at final follow up in Group A and Group B was noted as Grade I, II, III and IV in 2, 5, 15, 4 and 3, 10, 12 and 2 patients, respectively. These results shows significant difference in patients treated with Austin Moore and Cemented Bipolar. Cemented Bipolar prosthesis shows better pain score as compared to Austin Moore Group. Many of researches demonstrated that Cemented Bipolar Prosthesis resulted better post-operative pain score as compared to Austin Moore Prosthesis<sup>22-24</sup>. In our study, we found mortality rate 13.3% in Group A during follow up period while in Group B it was 10%. These results show that mortality rate was high in Austin Moore Group patients as compared to Cemented Bipolar Group patients. This result differs as compared to other studies in which there is no significant difference regarding mortality in Austin Moore Arthroplasty treated patients and Cemented Bipolar treated patients<sup>25</sup>.

## CONCLUSION

Fracture neck of femur is commonly found in elderly age population and Hemiarthroplasty is usually procedure being performed in Pakistan. In this study, It is concluded that Cemented Bipolar Hemiarthroplasty had better results with respect to HSS system, complications and mortality rate and also shows better results regarding post-operative pain as compared to Austin Moor Hemiarthroplasty.

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