

## Hemireplacement Arthroplasty for Fracture Neck Femur in Patients Aged More than 60 Years (40 CASES)



### Medical Science

**KEYWORDS :** Neck femur, Hemireplacement Arthroplasty, Austin Moore, Bipolar

**Parmar HP**

Assistant Professor, Dept of Orthopaedics, Medical College & SSG Hospital, Baroda

**Chavali VH**

Associate Professor, Dept of Orthopaedics, Medical College & SSG Hospital, Baroda

**Daveshwar RN**

Professor of Orthopaedics, Medical Superintendent, SSG Hospital, Baroda.

### ABSTRACT

**Aim:** To evaluate the results of Hemireplacement Arthroplasty in the management of fracture neck femur in patients aged more than sixty years.

**Methodology:** Forty five patients with age >60 years and with fracture type 31B (A.O.) were followed up for a period ranging from 12-31 months. Dorr classification was used to make the choice between the use of Austin Moore and Bipolar prosthesis. At final follow up patients (n=40) were assessed according to the Harris Hip Score.

**Results:** Austin Moore prosthesis was used in 26 and Bipolar was used in 19 patients. The Harris Hip Scoring revealed 30(75%) excellent, 7(17.5%) good, 2(5%) fair, 1(2.5%) poor results. Statistical analysis showed no significant difference in the outcome between the two types of prosthesis. No radiological complications were noted during follow up of all cases.

**Conclusion:** Austin Moore Hemireplacement arthroplasty of hip for femoral neck fractures is a good option in elderly patients. The mortality and morbidity are not high, operative procedure is simple, cost-effective, complications are less disabling, weight bearing is early and functional results are satisfactory.

### INTRODUCTION:

Femoral neck fractures have probably the greatest socio-economic impact of all fractures of human skeleton. Sir Watson Jones considered this fracture to be the terminal event in the life of feeble and fragile patients who used to die of cardiac, pulmonary, and renal complications aggravated by immobilization and prolonged recumbence.<sup>[1]</sup>

Hemi-Replacement Arthroplasty (HRA) is now the established modality of treatment in fractures of femoral neck in the elderly largely due to failure of other modalities<sup>[2]</sup> and problems of old age which contribute to the grim outcome of these fractures with internal fixation. Dissatisfaction with the results of operative fixation of displaced fracture neck femur in the elderly resulted in widespread use of prosthetic replacement as a primary treatment.<sup>[3, 4]</sup>

HRA with Austin Moore (AM) prosthesis however, with long term use, has shown intolerance of acetabular cartilage leading to acetabular erosion, high bone to metal friction shear forces developed during cyclic loading, stem loosening and acetabular protrusion especially in osteoporotic bones.<sup>[5]</sup>

Problems related to wear caused by 'Unipolar' AM prosthesis and successful result of low friction arthroplasty in total hip replacement, lead to the conclusion that application of the low friction principle to HRA would be desirable if it could be achieved without removing or distorting the acetabulum, which in nearly all such instances did not need to be replaced. The combination of these requirements led to the development of single assembly type of Total Hip Replacement i.e. 'Bipolar' HRA endoprosthesis, which has the advantages of simple insertion technique, self centering and low acetabular cartilage wear.<sup>[2,5,6]</sup>

The main purpose of this study was to evaluate results of HRA in the management of fracture neck femur in patients aged 60 years or more.

### METHODOLOGY:

#### Study Design and Sample

We present here a prospective study of intracapsular fractures of neck femur treated by HRA between March 2010 and Nov. 2012. Forty five patients were identified and studied based on the following selection criteria.

### Inclusion Criteria

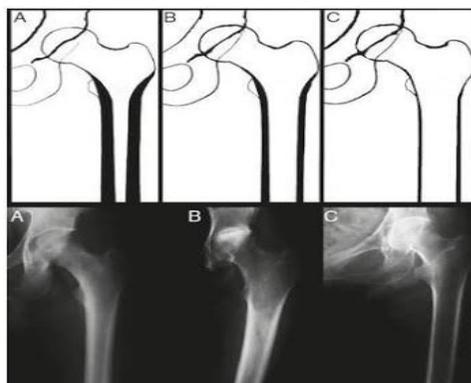
Fracture of neck femur defined by A.O. as 31B pattern in patients with age more than 60 years.

### Exclusion Criteria

Pathological fractures, previously operated proximal femur fractures, neuromuscular conditions that could affect functional assessment. With four patients failing to follow up and death of one patient during the course of study before completing at least six months we had 40(17 male, 23 female) patients remaining to study.

### Peri-operative procedures

All patients underwent thorough preoperative assessment and preparation to achieve fitness for surgery. Preoperative physiotherapy was instituted in every patient. Templating was done preoperatively to assess the size of prosthesis. All patients were operated in the lateral position using the modified Gibson approach.<sup>[7]</sup> Choice of implant was decided preoperatively based on Dorr classification (Fig. 1). For those patients with good cortico-medullary differentiation and funneling (Dorr type A) AM prosthesis was chosen. For those patients with poor cortico-medullary differentiation and funneling (Dorr type B & C) cemented Bipolar prosthesis was used. Sizing was repeated intraoperatively using the head sizer. A 1mm circumferential gap at the equator of the extracted head was the preferred choice if perfectly possible, else downsizing was opted.



**Figure1. Dorr classification of funneling of proximal femur.**

All prosthesis were fixed in 15 degree of anteversion. Capsule was closed if possible. Short external rotators were invariably fixed to the bone as close as possible to their original insertion site. Suction drain was removed after 48 hours and sutures were removed between 9 to 14 days of surgery. Static and active quadriceps exercises were begun on the same evening within the limits of comfort followed by high sitting exercises on the second postoperative day. Depending upon the pain and tolerance, patients were made to walk full weight bearing with the support of walker on third day and with walking stick in opposite hand between 5-7 days. Patients were discharged with walking stick and advised not to squat, not to sit cross legged, not to do active straight leg rising and to use stick in opposite hand while walking.

#### Follow up & Evaluation

Patients were followed up regularly over a period of one year. At each follow up patients were assessed clinically, functionally and radiologically. At final follow up all patients were assessed according to Harris Hip Score.

#### OBSERVATIONS AND RESULTS:

The results of the present study include forty patients (17M, 23F) treated with HRA for fracture neck femur in patients with age more than 60 years. The mean age of patients in our series was 66.5 years (Range: 61-85 years). Except for one patient who had fracture neck femur following high velocity trauma; all others were osteoporotic low velocity injuries. One patient had an associated Colle's fracture. 10 patients (40%) had associated systemic hypertension, 3(7.5%) had hypertension and diabetes, 1(2.5%) had associated respiratory illness.

Preoperative sizing of prosthetic head matched with intra-operative size in 34(85%) patients. 43 and 45 mm head size were the commonest prosthesis used (55%). Smallest size was 41 and largest size was 49mm. A.M. prosthesis was used in 23(57.5%) and Bipolar in 17(42.5%) patients available for final follow up.

Postoperatively 35(87.5%) patients were mobilized with walker on 3rd postoperative day. On immediate postoperative x-ray the stem was in neutral in 67.5% of cases, while in 7.5% of cases the stem was in varus position and in 25% cases the stem was in valgus.

No cases of nerve injury, dislocation, vascular injury, deep vein thrombosis or pulmonary embolism were noted in our series. 1 patient (2.5%) had superficial wound infection. This patient developed signs of infection in the first week of surgery which resolved by change in antibiotics. The average duration of hospital stay was 14.6 days (Range: 12-22). The average follow up period in our study was 21.1 months (Range: 12-31 months).

Sixty percent of patients had no pain at final follow up. 32.5% experienced slight pain which amounted to occasional ache or awareness of pain of low grade with no compromise in activity. 7.5% patients experienced mild to moderate pain. 85% of patients had no limp while 15% patients experienced mild to moderate limp while walking. Majority of patients (85%) did not require any form of support for routine activities. 3 patients required continuous support due to pain and old age related problems. 80% of patients were able to walk a good 'age-expected' distance following operation. The remaining had limited walking distance due to pain and associated medical conditions.

Thirty nine (97.25%) patients were comfortable in using

public transport, 32(80%) were able to climb stairs using the railing, 35(87.5%) were able to sit in ordinary chair for an hour. 95% patients were satisfied with the operation.

The Harris Hip Scoring revealed 30(75%) excellent, 7 (17.5%) good, 2(5%) fair, 1(2.5%) poor results (figures 1&2). No radiological complications were noted during follow up of all cases.

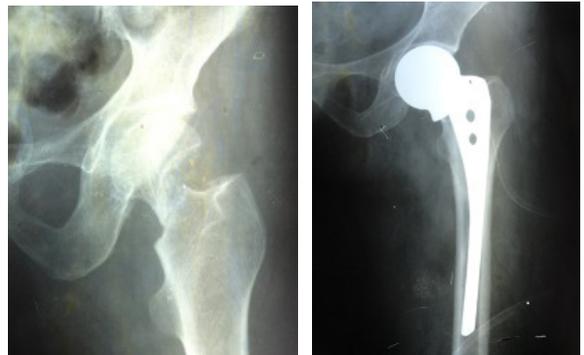


Figure1. Fixation with AM prosthesis



Figure2. Fixation with Bipolar prosthesis

#### DISCUSSION:

Joint replacement is considered the gold standard for fractures of the neck femur in advanced physiological age group. However, debate still continues in literature regarding the right method of treatment for such fractures. This study focused on the time tested HRA using AM and cemented Bipolar prosthesis in the treatment of such fractures.

The average age of our patients was 66.5 years with 57.5% of the patients being females. Female predominance has been reported by Moore and Cambell, values being 62.5% and 80.9% respectively.<sup>[8]</sup> The physiological age of our patients was consistently more advanced than the chronological age.

Thirty five percent of our patients had comorbid medical illness like hypertension, diabetes etc. Hinchey and Day reported similar problems in 84.6% of their patients.<sup>[4]</sup> Boyd and Salvatore reported 1.5% Colle's fractures in an overall 3% associated fractures in their patient series. Hinchey and Day reported 5.4% associated fractures. We had only one patient who had also sustained a Colle's fracture.

No patient in our series sustained fracture of femur during prosthesis insertion. Anderson and colleagues and Hinchey and Day emphasize that all fractures occur when the surgeon attempts to reduce the prosthesis.<sup>[4]</sup>

In our study 1 patient had superficial wound infection dur-

ing the early post-operative period. No event of dislocation was reported either early after surgery or during follow up. Temporary mental confusion was the commonest complication in the immediate post operative period of Hinchey and Day series.<sup>[4]</sup> Salvatti et al reported 14.3% mortality, 8.3% superficial infection in their patients. CM Robinson et al reported 11% mortality within one year, 5% infection, 2% deep vein-thrombosis and 3% dislocation in their series.<sup>[9]</sup> We had one mortality within one year of follow-up in our series.

Pain complained by 40% patients in our study was relieved by analgesics. 34 of our patients had no limping, 5 had slight and 1 had moderate limp. Limping is a common consequence of hemiarthroplasty in adults. Exact cause cannot be attributed for this. Alteration in the abductor mechanism due to excision of little more neck is the most probable cause [Saraf and Saxena, Hinchey and Day].<sup>[4]</sup>

Results	AM Prosthesis	Bi-polar prosthesis
Excellent	17	13
Good	4	3
Fair	1	1
Poor	1	0
Total	23	17
P value	0.6601	

**Table1. Comparison between outcome of AM prosthesis and Bipolar prosthesis**

92.5% of our patients had excellent to good results like Hinchey and Day who had 72.8%; Lanceford 81% and Anderson & Hamsa: 80.3%.<sup>[10]</sup> We too, in our study observed that the poor result was found in the patient who had moderate to marked pain following HRA. At final follow up 73.91% patients had excellent result with AM prosthesis and 76.47% patients had excellent with Bipolar prosthesis. Statistical Analysis (Table 1) shows no significant difference in their outcome results.

HRA of hip using AM prosthesis for femoral neck fractures is a good option in elderly patients. The mortality and morbidity are not high, operative procedure is simple, cost-effective, complications are less disabling, weight bearing is early and functional results are satisfactory. We feel that the prejudiced attitude against the prosthesis only because of a metal replacing a bone appears to be unjustified.

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