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# A retrospective evaluation of functional outcome of partial hip replacement for fracture neck femur

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**Abstract**
**Background**: Fracture neck femur is one of the most common fractures in the elderly age-group. The term "An Unsolved Fracture" still holds true for fracture neck femur. There is still a controversy about the use of Partial Hip Replacement for the treatment of these fractures in the elderly age group.
**Objective**: This paper is a retrospective analysis of the functional outcome of patients after partial hip replacement in our institute.
**Methods**: 120 patients with fracture neck femur were treated by Partial Hip Replacement in our hospital setup from 2011 to 2016 and had at least one-year follow-up. All patients had displaced fracture neck femur, and the standard posterior approach was used for all operations. Either Austin Moore or Bipolar Prosthesis was used. All patients were followed at the out patients clinic and evaluated by Harris Hip Score for functional outcome, at one year follow-up, and were classified into four levels: Poor, Fair, Good and Excellent.
**Results**: Our study reveals that 68.3% (82 out of 120) patients achieved excellent-to-good Harris Hip Score. Out of the 140 patients, three patients got infected (2.5%), one prosthetic hip dislocated (0.83%), and one experienced a peri-prosthetic fracture (0.83%).
**Conclusion**: Our study reveals that a significant number of patients achieved excellent-to-good results. We showed a relatively low incidence of complications.

**Keywords:** Fracture neck femur; Partial hip replacement; Austin Moore prosthesis; bipolar prosthesis

## Introduction
Fracture neck femur is one of the most common fractures in the elderly age-group, leading to significant morbidity and mortality[1], with one-year mortality rate of 14 to 36% [2, 3]. The geriatric population is fastest growing worldwide and fracture neck femur has arisen as a major public health problem. For the healthcare system, fracture neck femur poses an epidemic problem. Fracture neck femur has always been a great challenge to the orthopaedic surgeon and still remains the unsolved mystery as far as the treatment and its results are concerned.
Surgery is the first choice of treatment for fracture neck femur. Although some authors have reported better results with internal fixation [4], partial hip replacement is still accepted as the optimum treatment for displaced fracture neck femur in most elderly patients [5]. Total hip replacement is an alternative for active patients with a long life expectancy and arthritic joints.
The choice of prosthesis in partial hip replacement is still a matter of debate. Some authors advocate the unipolar prosthesis, whereas others prefer the bipolar prosthesis [5-13]. The theoretical advantage of bipolar prosthesis is the motion at its inner bearing in addition to the prosthesis-acetabulum interface [14]. This should decrease the amount of acetabular erosion, as evidenced radiologically, and reduce pain clinically. Nevertheless, studies have shown that the inner bearing loses mobility over time and that the bipolar prosthesis eventually behaves similarly to the unipolar prosthesis [15, 16]. Moreover, the two- to five-fold increased cost of the bipolar prosthesis compared with the unipolar prosthesis poses the question of whether it affects quality of life and functional results in elderly patients after fractures with high mortality rates.
The aim of this present study was to evaluate the functional, clinical and radiological outcomes following partial hip replacement with either Austin Moore prosthesis or Bipolar prosthesis for fracture neck femur.

We conducted this retrospective study, due to scarcity of information in the literature regarding the results of partial hip replacement and its pre and post injury functional outcomes after this procedure.

## Methods

This was a retrospective study done from April 2011 to December 2016. During this period, a total of 140 patients with displaced fracture neck femur aged 60 years and older were treated in our hospital, by partial hip replacement with either Austin Moore prosthesis or bipolar prosthesis. During the follow up, out of these 140 patients, 120 patients who agreed to participate in the study, had a post-operative follow-up of at least a year and fulfilled the inclusion criteria were included in this retrospective study. Inclusion criteria included pre-operative ambulatory status and at least one year post-operative follow-up. Patients with suspected pathological fractures and any other associated fractures and head injury were excluded from the study.

**Table 1:** Demographic and medical background data

| Parameter | No. | % |
|---|---|---|
| **Age (years)** | | |
| mean | 71.2 | |
| >85 | 30 | 25 |
| **Gender** | | |
| Female | 58 | 48.33 |
| Male | 62 | 51.66 |
| Follow up (average, years) | 3.5 (1-7y) | |
| **Number of pre-fracture comorbidities** | | |
| Hypertension | 48 | 40 |
| Diabetes Mellitus | 28 | 23.33 |
| IHD | 18 | 15 |
| CVA/hemiparesis | 12 | 10 |
| Renal Problems | 8 | 6.66 |
| COPD | 6 | 5 |

Radiologically, all patients had a displaced fracture neck femur, classified by Garden as Grade 3-4. Pre-operatively, Physical measures to minimize the risk of deep vein thrombosis were given. All patients were given antibiotics as per the hospital prophylactic protocol policy. We used the posterior approach for all operations, using either Austin Moore prosthesis or the bipolar prosthesis. Postoperatively, low molecular weight heparin was given for prophylaxis of deep vein thrombosis in all patients.

Post-operative follow-up at 1 year was conducted in our outpatient clinic and comprised history, physical examination, radiographic evaluation and functional analysis by Harris Hip Score, and divided into four levels on a scale of 100 points. A score of < 70 was defined as poor; 70-79 as fair; 80-89 as good, and 90-100 as excellent.

## Results

Out of the 140 patients of fracture neck femur operated by partial hip replacement, 20 patients were lost in follow-up before 1 year, and hence were not included in the study. Out of the 120 patients enrolled for this study, 62 (51.66%) of our patients were men, rest 58 (48.33%) were women.

The average duration of follow up was 3.5 years (range 1 to 7 years). The average age at operation was 71.2 years (Range 60-93), with 30 patients (25%) of age more than 85 years.

The medical problems at admission included 48 (40%) hypertension, 28 (23.33%) diabetes mellitus, 18 (15%) ischemic heart diseases, 12 (10%) CVA/hemiparesis, 8 (6.66%) renal problems and 6 (5%) COPD.

At one year post-operative follow-up, our study reveals that 29.2% (35 out of 120) patients achieved excellent Harris Hip Score, 39.2% (47 out of 120) patients - good, 22.5% (27 out of 120) patients - fair and 9.1% (11 out of 120) patients – poor Harris Hip Score. Our study reveals that 68.3% (82 out of 120) patients achieved excellent-to-good Harris Hip Score. The average Harris Hip Score at one year post-operative follow-up was 84.6 (good).

Regarding the major complications, three patients got infected (2.5%), one prosthetic hip dislocated (0.83%), and one experienced a peri-prosthetic fracture (0.83%) (Figure 1), no thromboembolic events were recorded. A significant number of patients' complaint of lateral thigh (35 patients- 29%) and groin pain (30 patients – 25%).

One significant finding was the presence of radiological signs of myositis ossificans (Figure 2) in vast majority of the patients (40 patients – 33.33%) on follow-up X-rays, although the patients were free from any clinical sign or symptom. Overall, we showed a relatively low incidence of complications.

**Fig 1:** Peri-prosthetic fracture

**Fig 2:** Myositis Ossificans

## Discussion

Displaced fracture neck femur can be treated with internal fixation, unipolar or bipolar hemiarthroplasty, or total hip

replacement[21]. Fracture neck femur is a common injury among elderly people[1]. Partial Hip Replacement is widely accepted as the optimum treatment for displaced fracture neck femur in most elderly patients [5]. However, the choice of prosthesis is controversial; some authors advocate the unipolar prosthesis, whereas others prefer the bipolar prosthesis [5-13]. The trend in our hospital setup is to treat displaced fracture neck femur in elderly age group with partial hip replacement. In this context, we conducted this present retrospective study to evaluate the functional, clinical and radiological outcomes following partial hip replacement with either Austin Moore prosthesis or Bipolar prosthesis for fracture neck femur.

At one year post-operative follow-up, our study reveals that 29.2% (35 out of 120) patients achieved excellent Harris Hip Score, 39.2% (47 out of 120) patients - good, 22.5% (27 out of 120) patients - fair and 9.1% (11 out of 120) patients – poor Harris Hip Score. The average Harris Hip Score at one year post-operative follow-up was 84.6 (good).

The infection rate in our institute was 2.5%, which is consistent with the world literature of 2- 4%. Among the 3 cases that got infected, two were diabetics, one male and one female, and third was an elderly male with very poor personal and oral hygiene. This old chap and another lady were managed at our hospital by removal of the prosthesis, thorough debridement and lavage and excision arthroplasty. Both of them did well after the operation. Another male patient with infection was treated elsewhere.

One complication of prosthetic hip dislocation occurred in a fatty female who had undergone Un-cemented Austin Moore prosthesis, and was managed by closed reduction under anaesthesia in emergency, followed by application of traction for 6 weeks.

One patient has a peri-prosthetic fracture at 7 months post-operative period and was managed operatively by application of a locking compression plate.

There are, however, some limitations in this study, which may have affected the results. First, the study was a retrospective evaluation and so is subject to the limitations of all retrospective studies. The functional questionnaire is subjective and moreover some patients don't remember their exact functional status before the injury, due to illiteracy.

Our long term follow up demonstrates the low incidence of complications such as thromboembolic events, etc. We have shown an insignificant incidence of operation dependent complications such as infection, dislocations and periprosthetic fracture.

This study suggests that this is a safe operation even in the elderly with significant medical problems with very low rates of immediate and late complications.

## Conclusion

Partial Hip Replacement with either Austin Moore prosthesis or Bipolar prosthesis is a relatively safe operation with low incidence of perioperative and late complication, and yields good results. It should be reserved for elderly debilitated patients, without evidence of acetabular changes.

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