

# Functional Outcome of Hemiarthroplasty in Femoral Neck Fracture After Two Years of Surgery

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## Abstract

**Introduction:** Fractures of the neck of the femur have always presented great challenges to orthopaedic surgeons and remain in many ways today the unsolved fractures as far as treatment and results are concerned.

**Method:** To evaluate the functional results at two years or more of Hemiarthroplasty of Hip done at Tata Main Hospital, Jamshedpur between January 2000–Dec 2000. To evaluate the variables which affect the final functional outcome.

**Results:** In this study of functional outcome of hemiarthroplasty 2 years after surgery, total no. of cases done during year 2000 (Jan 2000–Dec 2000) was 57(n). Out of these 57 cases 19 (33.33%) were male and 38 (66.66%) female. Females had double the no. of hemiarthroplasties than males. The mean age at operation was 67.03 years.

**Conclusions:** The functional outcomes may be improved further by a multidisciplinary approach to care, provided by team of health care personnel working closely together, may be an effective way to improve the short and long term outcomes.

**Keywords:** Fractures; hemiarthroplasty; intracapsular.

## Introduction

Fractures of the neck of the femur have always presented great challenges to orthopaedic surgeons and remain in many ways today the unsolved fractures as far as treatment and results are concerned. With life expectancy increasing with each decade, our society is becoming more of a geriatric society. Primary prosthetic replacement is indicated in elderly patients (>70 years of age) with displaced intracapsular fracture neck of femur. In this age group preservation of femoral head is not important. With increasing age the arguments against hemiarthroplasty diminish since the life expectancy of the patient becomes less than that of the arthroplasty and

the functional demands on the hip are less<sup>(1)</sup>. Advantages of hemiarthroplasty are that, it allows immediate weight bearing, to return elderly patients to activity and avoid complications of recumbency and inactivity. Prosthetic replacement eliminates a vascular necrosis and nonunion as complications of femoral neck fracture. Prosthetic replacement of displaced neck fractures reduces the incidence of re-operation as compared to internal fixation. The incidence of re-operation within 2 years range from 20% to 50% after internal fixation. The re-operation rate after hemiarthroplasty within the same interval was 6% to 18%.<sup>(2)</sup> Hemiarthroplasty constitutes an important modality of management in elderly patients. A significant number of elderly patients with displaced intracapsular fracture neck of femur undergo primary prosthetic replacement. To manage this great number of cases requires a considerable amount of finance and manpower. Also, a sizeable number of patients are lost to follow up and we do not know their exact outcome. To optimize the costs involved and know the outcome, we designed a study to know the functional outcome of hemiarthroplasties after two completed years. There

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different types of arthroplasty are available, namely a hemiarthroplasty (unipolar or bipolar) or a total hip replacement arthroplasty. The arthroplasty may be fixed with cement or may be friction fit type.

The unipolar arthroplasty, prosthesis designed by Moore and Thompson is commonly used. Austin Moore in 1940 developed a hemiarthroplasty.<sup>(3)</sup> He later perfected a hemi replacement endoprosthesis made of vitallium which incorporated the proper neck-shaft angle and had fenestrations in the stem which made it a "self-locking prosthesis". He also developed a specific posterior approach which after repeated modifications come to be known as the "The Southern Approach".<sup>(4)</sup>

### Material and Method

It is a retrospective study of prospectively collected data done in Tata Main Hospital, Jamshedpur, done during one year period from July 2002- July 2003. All the patients who sustained a femoral neck fracture and underwent primary prosthetic replacement in the year 2000 were taken for study. There were no exclusion criteria. The whole process was based on very accurate, computerized maintenance of records in our Hospital. The process of study started with my scanning of records through M.O.T. registers. I searched for all hemiarthroplasties done in year 2000. I noted down all the relevant details. Then with the help of data entry operators in the computer section of our Hospital, I took out the location of the patient at the time of admission. As this is an Industrial Hospital and a referral Hospital, most of the patients are from within the vicinity of this Hospital. In the next stage, I took out the case sheet of all my patients and obtained the relevant information from it.

In the final stage, I went to each patient's residence and did a door to door survey. Many of my patients' addresses were changed, but with the help of neighbours, I was guided to the correct place. I was able to collect information about more than 90% of my patients with this procedure.

Basic information for those included in the study was obtained from the patients themselves or from close relations where the patient was not able to give correct information. Total number of cases of hemiarthroplasties done in 1 year period [01-01-2000---31-12-2000] was 57 (n=57).

### Result

In this study of functional outcome of hemiarthroplasty 2 years after surgery, total no. of cases done during year 2000 (Jan 2000 – Dec 2000) was 57(n). Out of these 57 cases 19 (33.33%) were male and 38 (66.66%) female. Females had double the no. of hemiarthroplasties than males.

The mean age at operation was 67.03 years. Mean age for females at operation was 65.5 years. Mean age for males at operation was 70.1 years. The no. of survivors after 2 years was 43(75.6%). 14(24.40%) patients had expired. Of the expired; 9(64%) were females and 5(36%) were males. Of all expired males, maximum mortality (40%) was in the age range of 70–80 years and in females it was 60-70 years (44.44%). 3 males (60%) and 2 females (22.22%) expired in the time interval 0-3 months post-surgery. Total mortality at 3 months was 8.77%. 2 males (40%) and 4 females (44.44%) expired in the time interval 3–6 months post-surgery. Total mortality at 6 months was 19.39%. In the time interval 6-9 months there were no mortality in either male or female group. In the time interval 9-12 months 2 females (22.22%) expired. Total mortality at 12 months was 22.81%. In the interval 12-15 months, 15-18 months, 18-21 months there were no mortality in either male or female group. 1 female (11.11%) expired in the time interval 21-24 months post surgery. Thus total mortality at 24 months was 24.40%. The mean hospital stay was 24.57 days. Maximum no. of patients had a hospital stay in range of 20-30 days 26 (45.6%). Highest and lowest duration of hospital stay was 61 and 7 days, respectively. The no. of patients having pre-existing medical condition was 46 (80.7%). The various medical conditions were Anaemia (Hb<10 gm%) 25, COPD 5, CVA 6, Cardiac Arrhythmias 2, Diabetes Mellitus 7, Hypertension 22, Hemi paresis 5, Infective Endocarditis 1, Myocardial Infarction 1, Pulmonary tuberculosis 1, Parkinsonism 2, Seizure disorder 1, Valvular heart disease 1. The no. of patients who underwent revision surgery were 5 (9%). The no. of patients who had dislocation were 5 (9%). Out of 5 dislocations, 4 were unipolar and 1 bipolar. 4 dislocations (80%) were associated with posterior approach and 1 was associated with anterolateral approach. The no. of patients having post-op complications were 5 (9%). The various post-op complications were superficial stitch abscess 2 (3.50%), wound dehiscence 1 (1.75%) and deep seated infection 1 (1.75%). The no. of patients having other complications were 24 (42.10%). They

were pressure sore 15 (26.31%), urinary infection 8 (14.03%), bladder incontinence 1 (1.75%). The no of patients walking independently before fracture were 46 (80.70%), with walking stick 5 (8.71%) and non-ambulatory 6 (10.52%). The no of patients using walking Aids immediate post-operatively (3-6 months) were walker 16 (28.07%), crutches 27 (47.37%), non-ambulatory 14 (24.56%). The level of ambulation 2 years after surgery were independent walkers 21 (48.83%), with walking stick 20 (46.51%), crutches 1 (2.32%) and walker 1 (2.32%). Of the surviving patients after 2 years surgery 17 (39.53%) had Oxford Hip Score in the range of 12-24 (Good), 20 (46.51%), in the range 24-26 (fair), 6 (13.95%) more than 36 (poor).

### Discussion

A significant number of elderly patients undergo this surgery. It is a major surgery and a time-tested procedure for management of fracture neck of femur elderly patients. So, I undertook this study to know the variables which effect the final outcome of surgery, optimize the costs involved and to know, what can be done to better the final outcome. My study was a retrospective study. This study was possible because of very good computerized record keeping of our hospital. This is the biggest hospital in this area with a good trauma car. It caters to a large population in and around this town. It is an Industrial hospital and gives free treatment to their employee, and their family, a patient who is not in this company also gets treatment. Hedlund et al (1987) found a female to male predominance of 2:1 for patients >65 years of age for fractures of neck of femur. (32) Gullberg et al (1997) corroborated the same finding in their study. (33) In our study, 38 (66.66%) of cases were females and 19 (33.33%) cases were males. (2:1). Females had double the no of hemiarthroplasties than males. The mean age of operation was 67.03 years. Mean age for females was 65.5 years and mean age for males was 70.1 years at the time of operation. The mean age was less in our study as compared to studies of Western workers. Our mean age compared to a study done in Thailand by Nipatasaj et al (1995) where it was 68.4 years.<sup>(20)</sup> Thus, it indicates that in our set up patients have fracture neck femur at younger age compared to Western Countries. Marcus et al (1992) had found mortality at 3 months to be 7% and 24% at 24 months.<sup>(17)</sup> Jalovoora et al (1991) found mortality to be 12% at 3 months 19% at 12 months and 21% at 18 months.<sup>(16)</sup> Nather. A et al (1995) found in their studies the mortality rates at 3,6 and 12 months to be 6.4%,9.1% and 15%, respectively.<sup>(19)</sup> In our study, the

no of survivors after 2 years was 43 (75.6%). The no of expired was 14 out of which 9 (64%) were females and 5 (36%) were males. Mortality at 3,6,12 and 24 months were 8.77%,19.39%,22.81% and 24.40%. Richmond et al (2003) found that greatest mortality risk following hip fracture to be within 3 months of fracture with standardized mortality rates approaching that of control population by 2 years. Patients aged 65-84 had higher mortality risk when compared with patients aged  $\geq$  85. American society of Anaesthesiologists classification was predictive of increased mortality risk in younger patients, with these patients having triple the mortality risk when compared to the reference population at 2-year follow-up. The data demonstrate that hip fracture is not associated with significant excess mortality amongst patients older than age 85. Amongst younger patients, however, those with ASA classification of 3 or 4 have significant excess mortality following hip fracture that persists up to 2 years after injury.<sup>(34)</sup>

### Conclusion

The functional outcomes may be improved further by a multidisciplinary approach to care, provided by team of health care personnel working closely together, may be an effective way to improve the short and long term outcomes. In managing such cases physicians must understand the nature of injury, the potential impact on the patients level of functioning, and the secondary impact on the patients family. The primary goal of management is to return the patient to his or her level of function before the fracture. For most patients, this goal is best achieved by operative management followed by early mobilization. Physicians must recognize the complex problems associated with fractures and develop treatments plans that address all the factors that may affect the outcome.

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