

Functional Outcome of Bipolar Hemiarthroplasty

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ABSTRACT

Aim: To determine the success of bipolar hemiarthroplasty in patients with fracture neck of femur.

Study Design: Descriptive Case series.

Setting: Department of Orthopaedics and Spinal Surgery, Ghurki Trust Teaching Hospital/Lahore Medical & Dental College, Lahore from 3rd August 2011 to 4th August 2012.

Methodology: Fifty patients with fracture neck of femur treated with bipolar hemiarthroplasty were included. Investigations like X-rays pelvis with both hips were carried out. Epidural or spinal anaesthesia was used. Modified Hardinge direct lateral approach and supine position was used for bipolar prosthesis. Postoperatively all patients were mobilized with full weight-bearing after 24 to 48 hours with assistance from physiotherapist and intravenous antibiotic continued for 48-72 hours followed by orally till wound healed.

Results: There were 20 males and 30 females with male to female ratio 1:1.5. The mean±SD between the ages was 63.36±7.27 years. The success rate was 37 (74%) and 13 (26%) was not successful.

Conclusion: Bipolar hemiarthroplasty is safe and effective treatment modality in patients with femur neck fractures especially in older age patients.

Keywords: Femur, Bipolar hemiarthroplasty, Neck fracture

INTRODUCTION

Hip fractures are a significant public health issue in many countries. The number of hip fractures worldwide per year is estimated at 2.6 million by 2025 and 4.5 million by 2050¹. Femoral neck fractures are growing at an exponential rate as a result of the longevity of the general population. The fractured femoral neck in osteoporotic elderly patients is the classic fracture identified as an ally. In elderly patients with an already damaged bone, even minor trauma may be sufficient to cause fracture and as such, a broken femur neck is often referred to as a fracture of fragility^{2,3}.

The best option for treating intracapsular fractures cannot be based on the radiological appearance of the fracture alone and on the age of the patient. The intracapsular fracture does not need to be treated as an unsolved fracture. Internal fixation is suggested for selected fractures. Some require arthroplasty, and for others, either procedure may be used⁴.

Intracapsular fractures extending from the sub-capital to the basic cervical area of the proximal femur are femoral neck fractures. Epidemiological research in the US indicated that there were up to 250,000 femoral neck fractures each year⁵. A report in the UK found 20-35% mortality among femoral neck fracture patients within one year⁶. Due to growing old-age population and high-energy vehicular injuries, the incidence has increased remarkably. Femoral neck fractures are typically accompanied by osteoporosis in the elderly population⁷. It has shown that 84% of femoral neck fracture patients have either mild or severe osteoporosis. It is typically caused by high-energy trauma, often associated with multiple injuries, in young patients⁸.

Hip fracture treatment is based on the features of the fracture and individual patient variables, such as ambulatory pre-injury status, age, cognitive capacity, and co-morbidities. Alternative treatments have included open reduction with internal fixation by screw fixation screws, unipolar and bipolar hemiarthroplasty, or complete hip arthroplasty⁹. According to the Maini¹⁰ report, 204 patients had excellent to decent results in a total of 271 adult patients with bipolar hemiarthroplasty. In 75.3% of patients, thus, success would be accomplished in terms of functional outcome (good and excellent).

Unipolar hemiarthroplasty is commonly performed in Pakistan in the elderly population, but it becomes traumatic after a few years and has a high revision rate in younger patients¹¹. Complete hip arthroplasty is costly and requires extensive rehabilitation.

Bipolar hemiarthroplasty addresses both problems because it is inexpensive compared to complete hip arthroplasty and have a better outcome than unipolar hemiarthroplasty¹⁰. I want to perform this research because there is no local study on the outcome of bipolar hemiarthroplasty. This will assist orthopaedic surgeons in selecting a safer and more affordable choice for treatment.

MATERIALS AND METHODS

This descriptive study was conducted at the Department of Orthopaedics and Spine surgery Ghurki Trust Teaching Hospital, Lahore Medical and Dental College, Lahore from 3rd August 2011 to 4th August 2012. Fifty patients with fracture neck of femur treated with bipolar hemiarthroplasty were comprised. All patients age >50 years of either sex, intracapsular fracture neck of femur not older than 2 weeks diagnosed on X-ray pelvis were included. Patients with basicervical fracture, disseminated malignancy or pathological fracture and uncontrolled Parkinsonism were

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excluded. Demographic information like name, age and gender was recorded. Investigations like X-rays pelvis with hips, chest and routine blood investigation were carried out. Epidural or spinal anesthesia was used. Modified Hardinge direct lateral approach and supine position was used for bipolar prosthesis. Postoperatively all patients were mobilized with full weight-bearing after 24 to 48 hours with assistance from physiotherapist and intravenous antibiotic continued for 48-72 hours, followed by orally till wound healed. Outpatient assessment was carried out at 2 weeks, 6 weeks, 3 months and 6 months after operation and series of subjective assessments were taken to determine the frequency of success. The data was entered and analyzed through SPSS-20.

RESULTS

There were 20 males (40%) and 30 females (60%). Nineteen patients (39%) between 50-60 years, 29 patients (56%) between 61-70 years and 2 patients (4%) between 71-80 years with mean age was as 63.36 ± 7.27 years (Table 1). The success rate was 37(74%) and 13(26%) was not successful (Table 2).

Table 1: Demographic information of the patients

Variable	No.	%
Gender		
Males	20	40.0
Females	30	60.0
Age (years)		
50 – 60	19	38.0
61 – 70	29	58.0
71 – 80	2	4.0

Table 2: Frequency and percentage of success (n=50)

Success	Frequency	Percentage
Yes	37	74.0
No	13	26.0

DISCUSSION

The selection of treatment and outcomes determination in very elderly patients with hip fracture is problematic due to their low life expectancy. This makes early gratification as vital as long lasting results.¹² The hip fracture care is to return to pre-injured mobility at an annual mortality rate of 30%, as early as possible¹³.

The treatment of femoral neck fractures in the elderly has always been controversial. Conserving the hip joint and preventing pro-operatively inserted complications were cited as benefit by those who supported open reduction and internal fixation, whereas those who supported replacement by a pro-operatively femoral head found its benefits to include shortened postoperative recovery period and avoidance of cure issues¹⁴⁻¹⁸.

Internal fixations are an uncontroversial treatment of femoral fractures of the undisplaced (Garden I and II)^{9,19}. The average rate of reoperation of IF was 19% (9% due to cure complications) and 33-50% (20% due to healing complications) for the undislocated fractures for patients who obtained internal fixation was 33% non-union and 16% avascular necrosis^{20,21}.

In a recent international study, there was consensus on the internal fixation care of young patients and elderly patients with the operative management of femoral neck

fractures in elderly patients. Unipolar or bipolar hemiarthroplastics was the most common treatment for elderly people, but the approach to elderly patients between 60 and 80 years was optimal.⁷

In elderly patients with displaced femoral neck fracture with concomitant acetabular disease (e.g., osteoarthritis, Paget's disease, pneumatic arthritis), total hip arthroplasty (THA) is currently an approved treatment choice.¹⁷ The rate of dislocation of femoral neck fractured patients with THA is higher than in the patients treated electively with THA for arthritis.¹⁸ The rise in dislocation rates has been attributed in the fracture community to an increase in motion.²⁰ In the preoperative diagnosis, Berry et al²² demonstrated a 1.8-fold higher risk estimate of dislocation. In patients with cognitive disability and dementia, complete hip arthroplasty is contraindicated because it presents major difficulties for a treating surgeon in many ways, such as non-conformity, issues with assimilatory recovery, repeated co-morbidities and 32% higher dislocation rates^{21,23}.

Hemiarthroplasty using Austin Moore prosthesis remains a common choice.⁹ It is indicated in old fragile patient with home mobility status. For more than 50 years, univertise hemiarthroplasty has been used to treat femoral neck fractures for brief periods (2 to 5 years after operation), with the low rates of infections and disproportion in patients treated with unipolar hemiarthroplasty.

Bipolar prostheses reduce acetabular wear and increase prosthesis life and function.^{24,25} Compared to unipolar hemiarthroplasty, bipolar hemiarthroplasty confers better^{24,26} or similar overall outcomes as well as better pain relief and function²⁷. Bipolar hemiarthroplasty has less operating time.

In the present study, patients who may walk outside with a non-assisted or one stick prior to injury have been seen as successful and handled with cemented bipolar hemiarthroplasty. The history of slip and fall was present in most patients between the ages of 50-80. 40% were male and 60% were female. In the study 40% were male. This shows that females are more likely to be osteoporotic in our culture due to postmenopausal shifts. Anterolateral Modified Harginge approach used as superior to posterior approach with reduced dislocation rate.^{28,29} Patients mobilised with a fully weight bearing tolerance. They were taught about the techniques of mobilisation and could sit on a top chair immediately after surgery and leave the crutches at their ease. There was no bound after 06 weeks. 37 (74%) patients were able to walk with or without a stick without discomfort after six weeks, three months and 6 months of follow-up. The bipolar hemiarthroplastically dislocation rate was 1% comparable to the deep infection analysis in 50 patients of 0 to 3% and 1%. Furthermore, the use of modular design prosthesis can help us to review the proper part without any acetabular erosion/protrusion, and nor any femoral loosening incidence due to short follow-ups.^{30,31} When appropriate. In another analysis the satisfaction of all patients with the treatment has been questioned for the patients alive and families of deceased patients. The procedure was 67.2% satisfied. Most patients have maintained their preoperative status.

CONCLUSION

Following cemented bipolar hemiarthroplasty, elderly patients who are fit and physiologically young with displaced neck femur fracture are able to ambulate early. The complication rate is low, the long survival of the component and the functional status of pre-injury is restored in most patients. Instead of a total prosthesis, we used a bipolar prosthesis because the surgical procedure is simpler, easier and more economical to perform than a total hip replacement under emergency conditions.

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