

A study of functional outcomes following cemented bipolar hemiarthroplasty for fracture neck of femur at Kodagu.

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Abstract

Background: Fractures neck femurs are the most devastating injuries sustained by elderly population. The treatment goals for femoral neck fractures are early return to a satisfactory functional status. Bipolar hemiarthroplasty has the advantage of less erosion and protrusion of acetabulum. Usage of PMMA cement eases rehabilitation. This study was conducted to assess the functional outcomes following cemented bipolar hemiarthroplasty for fracture neck of femur at tertiary health care hospital. **Material and Methods:** A total of 35 patients with isolated fractures of neck of femur above the age of 50 years were operated using Moore's posterior approach. Cemented bipolar hemiarthroplasty was done. Minimum follow up of 12 months and modified Harris Hip Score was noted and radiographs of the affected hip were taken. **Results:** Excellent score was observed in majority i.e., 13 (37.1%) of the patients, whereas 6 (17.1%) had poor score. A steady increase in the Modified Harris Hip Score was seen in most patients between each follow-up. Superficial infection in the form of a wound dehiscence was seen in five patients who were diabetic. There were no late postoperative complications. **Conclusion:** Majority of the patients had satisfactory functional outcome without any major complication. Cemented bipolar hemiarthroplasty is found to be an effective treatment option in fracture neck of femur in the elderly population with good recovery even in presence of co-morbidities.

Key Words: Fracture neck of femur, cemented bipolar hemiarthroplasty, functional outcomes, Modified Harris Hip Score.

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INTRODUCTION

Fractures neck femurs are the most devastating injuries sustained by elderly population who are likely to have unsteadiness of gait and reduced bone mineral density, predisposing to fracture. Elderly osteoporotic women are at greatest risk¹. The incidence has increased significantly

in recent years and is expected to continue to rise with increasing life expectancy of elderly patients². In most of the patients, the mechanism of injury varies from falls directly onto the hip to a twisting mechanism in which the patient's foot is planted and the body rotates. There is generally deficient elastic resistance in the fractured bone³. The best choice of surgical procedure for hip fracture is complex and evolving. Treatment options include open reduction and internal fixation, hemiarthroplasty, or total hip arthroplasty⁴. The treatment goals for femoral neck fractures are early return to a satisfactory functional status along with the minimization of mortality, morbidity and the need for re-operation. Numerous studies have provided evidence for better outcomes after arthroplasty compared to internal fixation in terms of functional outcomes and better quality of life^{3,5}. Bipolar hemiarthroplasty has the advantage of less erosion and protrusion of acetabulum as there is a dual

articulation between the inner head and shell and shell and acetabulum. To overcome the problem of stem loosening and migration PMMA cement has been used as a grouting agent to replace thinning trabecular bone which eases rehabilitation. This study was conducted to assess the functional outcomes following cemented bipolar hemiarthroplasty for fracture neck of femur at tertiary health care centre.

MATERIAL AND METHODS

This prospective observational study was conducted over a period of two years at kodagu. All cases were operated at Ashwini hospital, madikeri during the period of 2015-16. During a study period, 35 patients were included in the study and followed up for a period of 12 months. Patients with isolated fractures of neck of femur above the age of 50 years, who were community/ household ambulators were operated with cemented bipolar hemiarthroplasty after written informed consent. Patients below the age of 50 years, non-ambulators, without X-ray or CT-scan diagnosis and unwilling for surgery were excluded from the study. All patients were evaluated pre-operatively by a detailed history and clinical examination. All patients were put on skin traction. Associated medical conditions were treated. Blood pressure of hypertensives were controlled and diabetics on oral hypoglycemic agents were shifted on insulin. Pre-operative deep breathing exercises were started from day 1 of admission. All measures were taken so that the patients could be taken up for surgery at the earliest. Patients were kept nil by mouth for six hours prior to surgery. Pre-anesthetic medications and antibiotics were given to all patients. Majority of patients were operated under spinal or combined spinal epidural anaesthesia and a few patients were given general anaesthesia. All the patients were operated using Moore's posterior approach. Cemented bipolar hemiarthroplasty was done. Post-operatively, patients were kept in the ward with limbs in wide abduction with help of abduction pillow. Adduction, internal rotation and extreme flexion were avoided. Static quadriceps and gluteal exercises commenced from the first day. From the second day, patients were allowed to sit up. Ambulation was started within a week with crutch walking and progressive weight bearing. Suture removal was done on 12th post-operative day. Strengthening exercises consisting of abduction of hip joint and active flexion and extension of knee joint was done under supervision of the surgeon. All patients were advised not to sit cross-legged or squat. All patients were followed up monthly for first 3 months and then at 6 months and 12 months. Minimum follow up of 12 months and modified Harris Hip Score⁷ was noted and radiographs of the affected hip were taken.

RESULTS

All the patients in the study included were above the age of 50 years with the average age of the patients was 65.4 years. Out of 35 patients, 23 were females and 26 patients had co-morbidities. 14 patients had diabetes mellitus, 9 had hypertension, 2 had coronary artery disease and one patient had chronic renal failure. In this study, 22 patients had left sided fractures.

Table 1: Demographic characteristics of the study population

Demographic characteristics	No. of patients (%)
Age groups (years)	
51-60	09 (25.7%)
61-70	17 (48.6%)
71-80	07 (20%)
>80	02 (5.7%)
Sex	
Male	12 (34.3%)
Female	23 (65.7%)
Co-morbid conditions	
Hypertension	09 (25.7%)
Diabetes mellitus	14 (40%)
Coronary artery disease	02 (5.7%)
Chronic renal disease	01 (2.8%)

Table 2 shows results from Modified Harris Hip Score after 1 year of surgery. Excellent score was observed in majority i.e., 13 (37.1%) of the patients, whereas 6 (17.1%) had poor score.

Table 2: Modified Harris Hip Scores after 1 year of surgery

Modified Harris Hip Score	Frequency	Percentage
Excellent	13	37.1%
Good	09	25.7%
Fair	07	20%
Poor	06	17.1%
Total	35	100%

The average Harris Hip Score of 35 patients at 3 months after surgery was 72.68 (range 58.41 to 84.25), at 6 months was 81.42 (range 60.21 to 94.5) and at 12 months the average Harris Hip Score was 86.84 with a maximum score of 95.50 and a minimum score of 71.26. A steady increase in the Harris Hip Score was seen in most patients between each follow-up. The minimum duration of hospital stay amongst the study patients was 14 days and maximum duration was 29 days with the average being 22 days. Superficial infection in the form of a wound dehiscence was seen in five patients who were diabetic. The infection resolved without any sequelae. There were no late postoperative complications like loosening, dislocation, erosion, secondary osteoarthritis or periprosthetic fracture.

DISCUSSION

The aim of treatment in femoral neck fracture is early return to a satisfactory functional status along with the

minimization of mortality, morbidity and the need for re-operation. The mean age of the patients in the present study was 65.4 years. These type of fractures are common in elderly population. Majority of our study patients (68%) sustained the injury due to a trivial trauma like slipping. This is a very common occurrence in elderly population where poor vision and lack of neuromuscular coordination is a problem. The results of our study showed that age of the patient had minimal influence on the final functional outcome. In present study, higher number of females sustained a fracture neck of femur as compared to the male population. Elderly females are more prone to fracture neck of femur due to osteoporosis induced by menopause^{1,8}. All the patients in present study were available for follow up at one year. Mortality rate in hip fractures is more during the first year but after one year the mortality rate is comparable to that of the general population.

Diabetes was found to be the most common co-morbidity seen in 14 (40%) of the study patients followed by hypertension in 9 (25.7%). These co-morbid conditions affected post-operative rehabilitation significantly. This also had an effect on the final functional outcome of the surgery. Koval *et al* and Barnes observed the similar findings^{9,10}. In all the 35 operated patients, excellent score was observed in majority i.e., 13 (37.1%) of the patients and good score in 9 (25.7%) patients, whereas 6 (17.1%) had poor score. Moshein *et al* reported excellent results in 40% of the cases and good results in 22% of cases¹¹. Similarly, another study by Lestrangle reported excellent results in 39.6% of cases and good results in 31.2% of cases¹². Maricevic *et al* reported no poor results in elderly patients with femoral neck fracture treated with bipolar hemiarthroplasty¹³. Superficial infection in the form of a wound dehiscence was seen in five patients who were diabetic. These diabetics were managed by adequate control of the diabetic status and appropriate antibiotics based on culture-sensitivity results. The infection resolved without any sequelae. Nottage *et al* reported 3.9% infection rate after bipolar hemiarthroplasty in their study¹⁴. There were no late postoperative complications like loosening, dislocation, erosion, secondary osteoarthritis or periprosthetic fracture. Overall, majority of the patients in our study had satisfactory functional outcome without any major complication. Cemented bipolar hemiarthroplasty is found to be an effective

treatment option in fracture neck of femur in the elderly population with good recovery even in presence of co-morbidities.

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