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Original Research Article

Functional Outcome of Cemented Bipolar Hemi Arthroplasty for Fracture Neck of Femur in Elderly

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Abstract: Indian community has increased geriatric population due to modified healthy habits and this has increased the longevity of living amongst them. But age related degenerative changes has a parallel impact on the elderly. Incidence of fractures will raise in the elderly population in the years to come with fracture neck of femur at an increased rate. Hence a detailed evaluation and a stronger study helps in increasing the quality and quantity of life among the geriatric age group. An effective management for fracture neck of femur can bring forth early mobilization and live an independent life, thereby preventing all fracture related complications in elderly population. This study was aimed at evaluating the functional outcome of cemented bipolar hemi arthroplasty as a primary treatment for fracture neck of femur in elderly. It was a prospective study involving 40 elderly patients with fracture neck of femur. They were surgically managed by cemented bipolar hemi arthroplasty. These patients were followed up regularly for three weeks, three months, six months, and nine months. And then followed once in a year for a period of 4 years' duration. Mean age of the patient in this study was 72.525±8. 174.We have followed 40 elderly patients who had suffered fracture neck of femur. They had an immediate post-operative Harris Hip Score of 79.56±8.45 which improved up to 90.1±15.57 at the end of four years. The average post-operative mobilization duration was 3.45 days and was discharged at an average duration of 13.825 days. Subsequently follow up till the end of 4 years our study had shown 82.5% good to excellent results, were as poor to fair results sum up to ten percent. This study had shown that cemented bipolar hemi arthroplasty for fracture neck of femur in elderly had given better functional outcome.
Keywords: Fracture neck of femur, Cemented Bipolar Hemi arthroplasty, elderly, functional outcome, Harris hip score

INTRODUCTION

Fracture neck of femur most commonly occurs in the elderly age group even after a trivial fall. Therefore, an intense methodology has to be adopted for early mobility to decrease mortality rate and to live independently. United nation has proposed 60 years and above as elderly age group as they were prone for various type of fracture and other co-morbid illness leading to increased mortality rate[2]. In view of associated impaired mobility and increased mortality rate in elderly age group due to fracture neck of femur, immediate surgical intervention with cemented bipolar hemi arthroplasty had shown better outcome in early mobilization and return to live an independent life[3]. Bipolar hemi arthroplasty had more advantages than others because of decreased acetabular wear due to dual bearing system[4]. Hemi arthroplasty was the commonest choice for fracture neck of femur in elderly[5].

Aim of this study was to evaluate the functional outcome of cemented bipolar hemi arthroplasty for fracture neck of femur in elderly.

MATERIALS AND METHODS

This prospective study was done at Sree Balaji Medical College and Hospital, Chennai after getting ethical committee clearance. This study was conducted from November 2012 to October 2016.

Inclusion criteria: Elderly patients (>60 years) of age who had unilateral fracture neck of femur were included. Exclusion criteria includes poly trauma with contralateral fracture neck of femur. Psychiatric ailments, pathological fractures and fractures more than 48 hours of admission were not included in this study. All the 40 patients were admitted in the orthopaedic ward and immediate skin traction was applied for the immobilization of the fracture. X-rays of pelvis with both hips antero-posterior and lateral views of the

affected hip taken. Complete blood haemogram was done pre-operatively to assess the general health of the patient. Patients were optimized and posted for surgery within 48 hours. And pre-anaesthetic evaluation was done. All the patients were operated under spinal anaesthesia. Moore's approach [Southern] was used with the patient in lateral decubitus position. Through this approach the femoral head was extracted. Appropriate sized bipolar prosthesis was fixed with cement after adequate reaming. During fixation care was taken to restore the femoral head offset, neck length and ante-version to obtain a stable hip joint post reduction and to repair the capsule and the short external rotators. The wound was sutured with a negative suction drain. Post-operatively intra venous antibiotics were given for five days prophylactically. On the second post-operative day patients were encouraged to walk partial weight bearing with walker support after drain removal and the drain tip was sent for culture and sensitivity as a routine. Suture removal was done on the 12^{th} post-operative day. Patients were advised to walk full weight bearing with walker frame for the period of two months till they were comfortable to walk without support in order to avoid falling again. Patients were advised to avoid squatting and sitting cross legged. Patients were discharged after suture removal and were followed up at three weeks, three months, six months, nine months, two years, three years and four years for functional evaluation of the operated hip joint Functional outcome was evaluated by Harris Hip Scoring method[1] and x-ray of the hip joint was taken to study the implant position, statistical data analysis was done and reported as Mean, Percentage and Standard deviation.

RESULTS

40 elderly patients who sustained unilateral, isolated fracture neck of femur were taken up for study. Patients were followed up for duration of four years. One patient expired six months after surgery due to other medical ailment. He was not included in the final assessment. Average age of the elderly patient that was taken up for the study 72.525±8.174. 32 patients were community ambulant prior to injury. six were walking with support (cane), two were walking with manual assistance. 36 number of patients had a trivial fall. Four number of patients met with a road traffic accident. All the patients had unilateral, isolated fracture neck of femur without any neurovascular deficit. Patient data is depicted below in table 1 and table 2. The mean age as compared with the study group of Mayi SC *et al* [7] found to be statistically similar with a probability of significance difference of p=0.4255 (p value= 0.42)

Table 1: Patient Characteristics

Variable	Value
Sex	
Men	13
Women	27
Age, Mean SD	**72.525±8.174**
Pre-surgery mobility status	
Unaided	32
Cane	6
Walking frame	2

(P value =0.42 as compared with Mayi SC *et al* [7])

(Age in years, number of males and females and pre surgery mobility status in numbers)

Table 2: Patient Data

Patients	Numbers/Mean
Total patients	40
Mean Age of patients in years	72.525±8.174 (p=0.4255)
Male: Female	13: 27
Hip joint operated	
Right side	28
Left side	12
Fracture neck of femur (Garden's Classification)	
Type 1	0
Type 2	2
Type 3	20
Type 4	18

(Age in years, number of males and females)

The outcome of our study was compared with the previous study made by Mayi SC *et al* [7] where they studied 20 patients with the average Harris hip score of 84.26 at the end of 12 months postoperatively our study found to have an average score of 90.10 at the end of four years with a p value of 0.46 at the end of 6months follow-up of both studies.

Average post-operative mobilization period was 3.45 days. Average hospital stay was 13.825 days. Mean Harris Hip Score in the post-operative period was 79.55±8.45 which gradually improved at three weeks, three months, six months, nine months, two years, three years, four years. The functional outcome is tabulated as given below in table 3 and table 4.

Table 3: Mean Harris Hip Score during Follow Up

Follow up	Mean HHS with SD
Immediate post-operative	79.55±8.45
3 weeks	80.8±8.47
3 months	84.67±7.76
6 months	83.9±15.43
9 months	85.86±15.6
2 years	86.55±15.63
3 years	88.27±15.23
4 years	90.1±15.57

(HHS- Harris Hip Score, SD- standard deviation)
(6 months post-operative HHS as compared with Mayi SC *et al.;* [7] p =0.46)

Table 4: Functional Outcome

Harris Hip Score grading	Number of patients	Percent	Cumulative percent
Excellent (90-100)	19	47.5% (p value 0.64)	47.5
Good (80-89)	16	40% (p value 0.9)	87.5
Fair (70-79)	3	7.5%	95
Poor(<70)	1	2.5%	97.5
Number of death	1	2.5%	100

(p values of excellent and good outcomes are 0.64,0.9 respectively as compared with Mayi SC *et al*[7])

Grade I pressure sores were noted in three patients. And one patient developed DVT. And one patient had developed superficial wound infection. And they were treated accordingly.

DISCUSSION

The total number of elderly population in India is expected to rise by 8% of total population in 2012 to 19% by 2050[6]. This suggest the increase number of fractures that can be expected in the years to come. Fracture neck of femur should be the most common fracture amongst other types. Hence, a stronger study and a rich knowledge in this type of fracture in the elderly population would give a better quality of life and increase their quantity of life and support them having a good independent life. Early prosthetic replacement decreases morbidity and mortality in elderly people suffering with fracture neck of femur. And hence, primary cemented bipolar hemi arthroplasty is the suggested treatment for elderly patients[7]. In our study we have included elderly patients above 60 years of age with fracture neck of femur who were managed by cemented bipolar hemi arthroplasty. Our study included 40 patients who had fracture neck of femur above 60 years of age. During follow up 36 (90%) patients had no pain in the operated site by the end of four years. This was comparable to results obtained from the studies like Calder *et al* with 65% [8] and Sharoff *et al* with 88%[9]. This comparison shows that cemented bipolar hemi arthroplasty provided a pain free hip and an excellent functional outcome among the elderly population. Superficial infection was encountered in one patient 2.5% in this study which is less when compared to Lestrange (1990) had 83 patients with 2.8% infection rate[10]. There was no deep wound infection in the study. Nottage and McMaster reported deep wound infection in 3.9% and superficial wound breakdown in 3.9% [11]. Femoral stem varus malalignment was observed in 1 patient which was far less comparatively Gallinar [12]. In this study, 47.5% patients had excellent results. 40% had good results when compared to Sharoff *et al* who had 36% excellent and 46% good results and Moshein *et al* who had 40% excellent and 25% good results[9,13]. Our study had its

own limitations because the degree of intra-prosthesis motion at the inner- bearing of prosthesis was not evaluated as they were complicated and beyond the facilities availed at our disposal. Longer term studies were required to improve the long term functional outcome of cemented bipolar hemi arthroplasty for fracture neck of femur in elderly. The strength of the study was that the functional outcome of cemented bipolar hemi arthroplasty had shown an increased in quality and quantity of life with a better outcome.

CONCLUSION

In our study 40 patients with intracapsular neck of femur were surgically managed with cemented bipolar hemi arthroplasty and they were followed up for a period of four years excluding one patient who expired after six months post-operatively due to a medical ailment. The outcome of the study showed good to excellent results, therefore we conclude that cemented bipolar hemi arthroplasty in elderly patients gives a good functional outcome as it helps in early mobilization and decreases the complications associated with these fractures and supports them to live an independent life.

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