

Results of cemented bipolar hemiarthroplasty in fracture neck of femur in elderly

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Abstract

Background: Treatment of neck of femur fractures in elderly has been controversial as restoration of pre-fracture function is the goal. Currently, choices available for an orthopaedic surgeon for treating these fractures in elderly are unipolar hemiarthroplasty, bipolar hemiarthroplasty and total hip arthroplasty. Cemented Bipolar Hemiarthroplasty appears to be the best option for fracture neck femur in the elderly population. This study was conducted with the aim to assess the functional outcome of fracture neck of femur treated with cemented bipolar hemiarthroplasty in elderly.

Material and method: Sixty patients of femoral neck fracture were operated by cemented hemiarthroplasty from June 2012 to June 2014 and their functional outcome were assessed on the basis of Harris Hip Score.

Results: There were 65 patients in this study, but on the follow up period of 2 years, 3 patients died (due to other medical reasons) and 2 patients did not revert back, so remaining 60 cases were included in the study. At 12 months of follow-up the average Harris Hip Score of 44 patients was 85.70 with a maximum score of 94.40 and a minimum score of 66.38.

Conclusion: We conclude that cemented bipolar prosthesis for treating fracture neck of femur in elderly gives good functional outcome.

Keywords: Hemiarthroplasty, Bipolar Prosthesis, fracture neck femur.

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Introduction

Neck of femur fractures occurs predominantly in the elderly age group, typically results from low-energy trivial falls and may be associated with osteoporosis. In elderly, fracture of femoral neck is one of the most common injuries and always a great challenge to orthopaedic surgeons. The prevalence of this fracture doubles after the fifth decade of life. High rate of non-union and avascular necrosis are the poor outcomes of the patient treated with open reduction and internal fixation. Currently,

choices for orthopaedic surgeons for treating these fractures in elderly are unipolar hemiarthroplasty, bipolar hemiarthroplasty and total hip arthroplasty.

Acetabular erosion and loosening of stem giving rise to pain are the main problems encountered with unipolar prostheses (Austin Moore's Prosthesis [1] and Thompson's Prosthesis [2]). In 1974, Bateman [3] introduced the Bipolar prosthesis (initially popular as Bateman's prosthesis) having mobile head element and had head surface additional to allow

movements in the acetabulum. Greater range of movements, less post-operative pain, reduced incidence of acetabular erosion, reduction in the loosening of stem (when cement is used), higher percentage of satisfactory results, more rapid return to unassisted activity are the advantages of bipolar prosthesis over unipolar endoprosthesis. Total hip arthroplasty is still not popular as a treatment modality for these fractures because majority of the patients do well with hemiarthroplasty and also due to high costs involved. Use of the cement gained in popularity after Sir John Charnley [4] began using PMMA, intended for denture repair, to anchor femoral head prosthesis in the femur during total hip arthroplasties. Cemented Bipolar hemiarthroplasty thus appears a good option for fracture neck femur in the elderly population.

Material and methods

Sixty patients of femoral neck fracture who were admitted in R.D.Gardi Medical College and C.R.G. Hospital, Ujjain from June 2012 to June 2014 were included in this study. The inclusion criteria were patients with fracture of the femoral neck with Age of patient > 60 years, failed internal fixation, avascular necrosis of femoral head secondary to fracture of the femoral neck.

Patients below 60 years, patients with arthritic changes involving the acetabulum, pathological fractures, patients not willing for surgery and patients medically unfit for surgery were excluded from this study.

Patients satisfying the inclusion criteria, who required surgical intervention, were worked up clinically and radiologically. All patients selected for the study were examined

according to protocol, associated injuries, if any, were noted and investigations carried out in order to evaluate fitness for anesthesia. All the surgeries were performed under regional anaesthesia all patients were operated in lateral decubitus position by Moore's posterior approach.

Regular follow up of all cases was done at 1.5 month, 3 months, 6months, 9 months and 12 months. At each follow up patients were evaluated clinically using the Harris Hip Score and radiologically with appropriate X-rays.

Results

The average age was 71.6 years (range 61 – 90 years). Female predominance (65%). Left side affected in 39 (65%) and right side in 21(35%) patients. There were so many associated co morbidities, 11.66% of study patients had heart disease, 13.33% had diabetes, 13.33% had COPD, 31.66% had hypertension, 10% had ipsilateral knee osteoarthritis and 20% had no co-morbidity. The duration of surgery in 55% of cases was 90 -120 mins, 45% cases was 60-90mins. Average blood loss during the procedure in majority of the patients was below 200 ml. Limb lengthening (<1 cm) was observed in two patients (3.3%) postoperatively. 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 four patients who were diabetic. The infection resolved without any sequelae and there was no late reactivation of the same. There were no late postoperative complications like loosening, dislocation, erosion, secondary osteoarthritis, protrusio acetabuli or periprosthetic fracture.

Type	No. of patients	Percentage (%)
1.	0	0
2.	5	8.33
3.	21	35

4.	34	56.66
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Table 1: Garden classification [5]

The average Harris Hip Score [6] of 60 patients at 1.5 month after surgery was 61.88 with the highest score being 79.34 and the lowest being 42.81. The average Harris Hip Score at the second follow-up of 3 months was 71.78 (range 56.61 to 88.41). Average Harris Hip Score at 6 months was 80.66 (range 58.43 to 92.30). At nine months the average Harris Hip Score was

83.91 (range 62.34 to 94.36). At 12 months of follow-up the average Harris Hip Score of 44 was 85.70 with a maximum score of 94.40 and a minimum score of 66.38. Though a steady increase in the Harris Hip Score was seen in most patients between each follow-up there was not much change between the fourth (nine month) and fifth (twelfth month) follow-up.

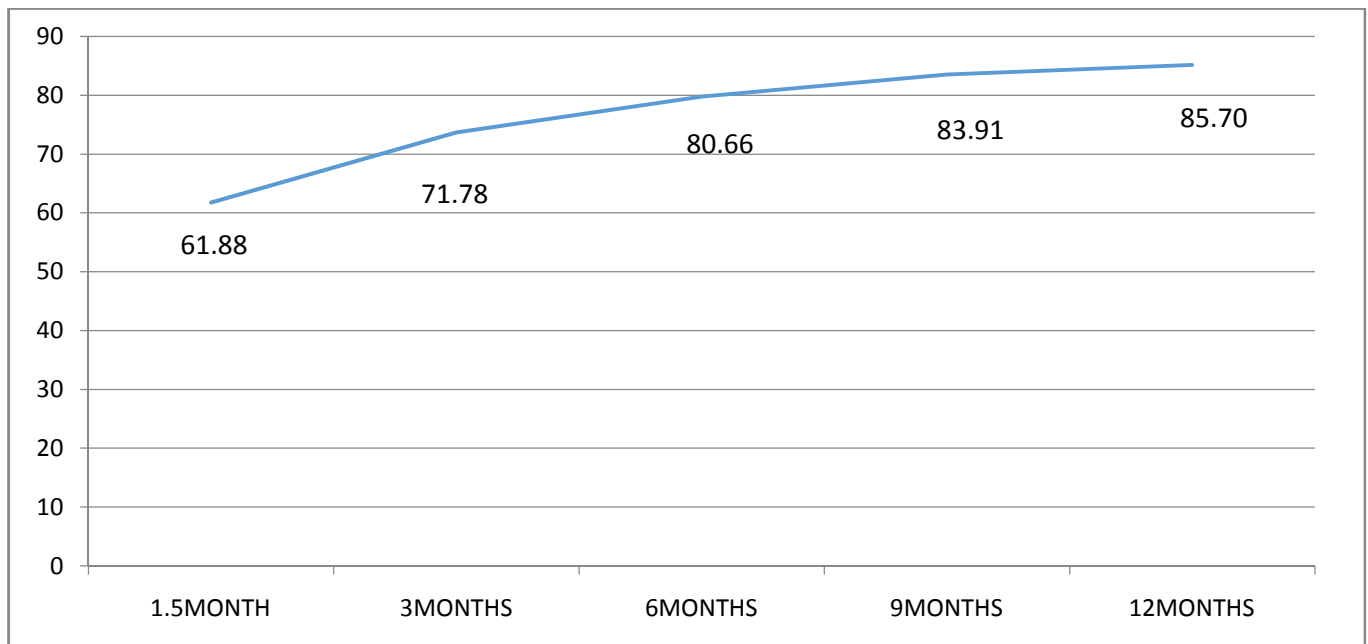


Figure 1: Graph showing average Harris hip score

In our study, out of 44 cases which were available for final 1 year of follow up 19 patients (43.18%) achieved excellent results, 17 patients (38.63%) achieved good results, 5 patients (11.36%) achieved fair results and 3 patients (6.8%) achieved poor results. 81.81% of the patients achieved an excellent or good result.

Discussion

The aim of surgery in fracture neck femur is early return to daily activities. This is particularly applicable to the elderly age group where complications need to be prevented. The mean age of the patients in the present study was 71.6 years. Patients with hip fractures have an increased mortality rate during the first year after

fracture but after one year the mortality rate is comparable to that of the general population. The results of our study showed that age of the patient had minimal influence on the final clinical result.

As in most standard studies, the present study also had a higher number of females with the left side more commonly affected than the right. Majority of our study patients (53.33%) sustained the injury due to a trivial trauma like tripping or slipping. This is a very common occurrence in elderly population where poor vision and lack of neuromuscular coordination is a problem.

All of our study patients had a displaced fracture of the neck of femur. Majority of the patients (61.66%) had a trans-cervical

fracture while 21.66% patients have sub-capital and 16.66 have basal fracture. The anatomical type of fracture and the displacement did not have any effect on the final function.

Diabetes was found to be the most common co-morbidity seen in 13.33% of the study patients. All patients had Type II Diabetes and were on oral hypoglycaemic agents. They were shifted to insulin pre-operatively and blood sugar values optimized before taking up for surgery. The other co-morbid conditions seen in the order of frequency were hypertension (31.66%), COPD (13.33%), heart disease (11.66) and ipsilateral knee osteoarthritis (10%). It was observed that the post-operative rehabilitation of patients was significantly affected by the presence of the above co-morbidities. This also had an effect on the final functional result of the procedure. Similar observations have been made by Koval et al and Bath [7,8,9].

In more than half of the cases, the blood loss was < 200ml for the whole procedure and in 23.33% of the others it was between 200-400ml. Only 13.33% of cases had a blood loss of >400 ml requiring a blood transfusion. It has been reported in literature that the average blood loss with hip hemiarthroplasty is less in the anterior approach as compared to the posterior approach. Most of the surgeries were completed between 90-120 minutes of starting the procedure. Similar duration of the procedure has been reported by Haidukewych, et al [10] and Drinker & Murray, et al [11]. Neither the intraoperative blood loss nor the duration of the procedure had any effect on final function.

Superficial infection in the form of a wound dehiscence was seen in one patient (10%) who was a diabetic. They were managed by adequate control of the diabetic status and appropriate antibiotics based on culture-sensitivity results. The infection resolved

without any sequelae and there was no late reactivation of the same. Infection rate of 3.9% after bipolar hemiarthroplasty is reported by Nottage, et al [12].

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. Average hospital stay of 18 days with bipolar hemiarthroplasty has been reported by Lestrage [13]. Drinker and Murray et al [11] have reported an average hospital stay of 23 days with the same procedure. There were no late postoperative complications like loosening, dislocation, erosion, secondary osteoarthritis, protrusio acetabuli or periprosthetic fracture. We are unable to comment upon long term acetabular erosion due to relative short follow up. None of our patient reported with post-operative femoral fractures. Langslet E et al [14] reported the prevalence of post-operative femoral fractures in 0.9% with cemented hemiarthroplasty. Maricevic et al [15] reported no poor results in elderly patients with femoral neck fracture treated with bipolar hemiarthroplasty, this study has 6.8% poor results.

In a meta-analysis of 106 reports on displaced femoral neck fractures, Lu-Yao et al [9] found the incidence of reoperation within 2 years to range from 20% to 36% after internal fixation in greater than 65 years old patients. The reoperation rate after hemiarthroplasty within the same time interval was 6% to 18%. He had 33% nonunion and 16% avascular necrosis for patients treated with internal fixation. He found rate of re-operation was double when unipolar prosthesis is used. None of our patients required revision surgery. As reported by Bhandari et al [16] in a meta-analysis of nine trials comparing arthroplasty with internal fixation in 1162 patients, found that arthroplasty significantly reduced the risk of revision surgery.

Overall, 19 patients (43.18%) had Excellent result, 17 patients (38.63%) had Good result, 5 patients (11.36%) had fair result and 3 patients (6.8%) had poor result. Overall, 81.81% of the patients had an excellent or good result. Our results are comparable with standard studies of bipolar hemiarthroplasty performed for fracture neck femur. Moshein et al [17] reported excellent results in 40% of the cases and good results in 22% of cases. Similarly, another study by Lestrage [13] reported excellent results in 39.6% of cases and good results in 31.2% of cases.

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Shortcomings of this study are non-randomised, non controlled study with short follow up.

Conclusion

Cemented Bipolar hemiarthroplasty for fractures of the femoral neck in elderly gives good functional outcome as per Harris Hip Score. A randomised controlled study with long follow up can prove superiority of cemented bipolar prosthesis over other prosthesis.