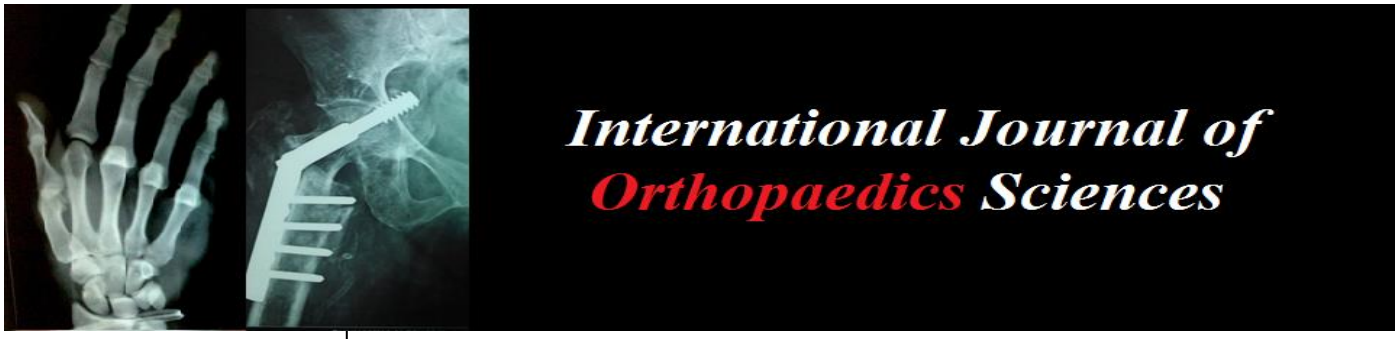

E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2020; 6(3): 32-36

www.orthopaper.com
Received: 18-05-2020
Accepted: 20-06-2020

Dr. Sahejpreet Singh Chhabra
Junior Resident, Department of Orthopaedics, Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh, India

Dr. Utkal Gupta
Department of Orthopaedics, Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh, India

Dr. Sanjay Gupta
Professor and Head, Department of Orthopaedics, Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh, India

Corresponding Author:
Dr. Sahejpreet Singh Chhabra
Junior Resident, Department of Orthopaedics, Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh, India

Functional outcome of bipolar hemiarthroplasty in fracture neck of femur

Dr. Sahejpreet Singh Chhabra, Dr. Utkal Gupta and Dr. Sanjay Gupta

DOI: https://doi.org/10.22271/ortho.2020.v6.i3a.2173

Abstract
Introduction: Femoral neck fractures occur most commonly in elderly females. They are common in patients above 60 years of age.
Materials and Method: We undertook this study to assess the functional outcome of bipolar hemiarthroplasty. 30 patients above 60 years of age, with intra-capsular fracture neck of femur were undertaken for the study. They were operated with either cemented bipolar hemiarthroplasty. The clinical and radiological follow-up was done for a minimum period of 6 months. The results were assessed using Harris hip score – modified (HHS).
Results: Out of 30 patients, 18 were females and 12 were males with an average age of 64 years. 14 patients had associated co-morbidities. After 6 months of follow-up using HHS, 14 had excellent results, 12 had good results, 1 had fair results and poor results were observed in 1 patient. The mean Harris hip score was 88.5. There was one mortality and one patient was lost to follow up. There was no stem subsidence, acetabular erosion, acetabular protrusion, or heterotopic ossification in any of the patients during the follow-up period.
Conclusion: All the patients had satisfactory functional outcome. To conclude, bipolar prosthesis is a safe option in treating fracture neck of femur in the elderly with good recovery in-spite of having several co-morbidities.

Keywords: Bipolar hemiarthroplasty, fracture neck femur, funtional outcome, Harris Hip Score

Introduction
One of the most common ailments of the hip joint is fracture neck of femur. In recent years the incidence of fracture neck of femur is increasing in the elderly and is the commonest injury causing morbidity and mortality in patients of geriatric age group [1].
Fracture neck of femur is commonly seen in old people but in India quite a good number of patients are young adults below the age of 50. It is however infrequent in children [2]. Most patients give a history of low energy fall as the cause of injury. In 2-3% of cases there is no history of trauma and the injury may be pathologic or a stress fracture [3].
Fractures of neck of the femur have always presented great challenges to orthopaedic surgeons. They are also associated with a lot of co-morbid conditions like hypertension, cardiac problems, diabetes and dementia. This combined with prolonged immobilization due to fractures leads to increased morbidity and mortality. Hence early mobilization after surgery is necessary in intracapsular neck fractures [4].
Undisplaced intracapsular hip fracture is almost invariably treated with internal fixation[6]. However; most of the fractures are displaced and occur predominantly in elderly female patients. Bones are osteoporotic in elderly patients. Despite the ubiquitous nature of these fractures, there is still a surprising degree of variation in treatment [4, 5]. Hemiarthroplasty is the most common treatment for displaced fractures of the femoral neck in the elderly and is associated with better functional outcome and fewer reoperations than internal fixation [5].
Bateman in 1974 introduced the prosthesis which had mobile head element and had additional head surface to allow movement within the acetabulum [6]. This led to reduced wear of acetabular surface and the prosthesis.
In modern days the bipolar prosthesis with cement is the best option wherein they can be more active, especially the modular bipolar prosthesis with or without cement can give a very good

active life to the patients treated. Further some surgeons would like to do total hip replacement in older patient, as a primary procedure. In spite of all the developments in field of replacement surgery most surgeons still prefer to do hemiarthroplasty as primary procedure as it is always possible to do total hip replacement at a later date [1].

This study was to evaluate the functional outcome of bipolar hemiarthroplasty in fracture neck of femur, by assessing the quality of life and degree of function in the operated limb.

Materials and Methods

A prospective study was conducted in the Department of Orthopaedics in Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly on 30 patients attending OPD and Emergency having fracture neck of femur, with a minimum follow up of 6 months. The Inclusion Criteria were-

1. Patients having intra-capsular fracture of neck of femur.
2. Adult patients aged more than 60 years both male and female.
3. Patients medically fit for surgery.
4. Patients who were ambulatory before fracture.

Exclusion Criteria were

1. Patients below 60 years of age.
2. Pathological fracture of the neck of femur.
3. Patients not willing for surgery

All patients were evaluated pre-operatively by a detailed history and clinical examination. Associated medical conditions were treated. Blood pressure of hypertensives were controlled and diabetics on oral hypoglycemic agents were shifted on insulin. Patients were kept nil by mouth for six hours prior to surgery. Pre-anesthetic medications and antibiotic protocol (in which a cephalosporin was given 30 minutes before surgery and then 12th hourly post-operatively till 4 days) was given to all patients. All patients were operated under Spinal or combined Spinal Epidural. All the patients were operated using Moore's posterior approach and cemented bipolar hemiarthroplasty was done.

Post-operatively, patients were kept with limbs in wide abduction with help of abduction pillow. Adduction, internal rotation and extreme flexion were avoided in view of dislocation.

Static quadriceps and gluteal exercises commenced from the first day. From the second day, patients were allowed to sit up. Partial weight bearing walker walking was started on 3rd post-operative day and progressive weight bearing encouraged. Suture removal was done on 14th 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 physiotherapist.

All patients were advised not to sit cross-legged or squat. All patients were followed up at 6 weeks, 3 months and then at 6 months. Minimum follow up was of 6 months and modified Harris Hip Score was noted and radiographs of the affected hip were taken.

Data was analyzed using the computer software, Statistical Package for Social Sciences (SPSS) Version 17. Statistical test used was Chi Square test.

Results

Out of the 30 patients, there was 1 mortality and 1 was lost to follow up before 6 month duration period. So the clinical and radiological outcome of 28 patients were assessed in this study. The age-wise distribution of the patients in the study were as in table 1. All patients in this study were above 60 years.

Table 1: The age-wise distribution of the patients

Age group	Frequency	%
60-69 YEARS	19	63.33
70-79 YEARS	10	33.33
>80 YEARS	1	3.33
TOTAL	30	100

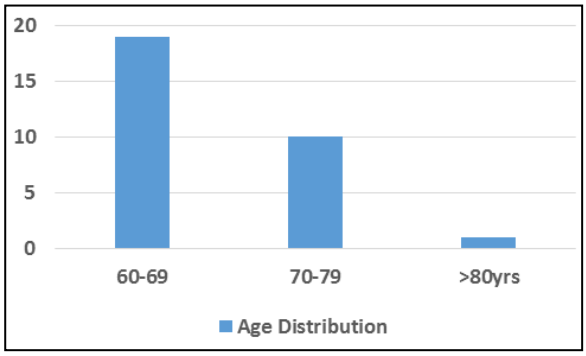

Fig 1: showing age distribution

In the study of 30 patients with neck of femur fracture, the average age of the patients was 67.2 years.

Left side was involved in 17 patients and right side in 13, and the female-male ratio was 1.5:1.

Fig 2: (A) Gender (B) Side involved

Out of 30 patients 22 patients had co-morbid conditions. 7 patients had DM alone, 8 had HTN alone, 4 had DM/HTN, 1 had HTN/CKD, 1 had DM/HTN/CKD and 1 had DM/HTN with diaphragmatic hernia.

There were 5 basicervical fractures, 14 transcervical fractures and 11 subcapital fractures of the femoral neck.

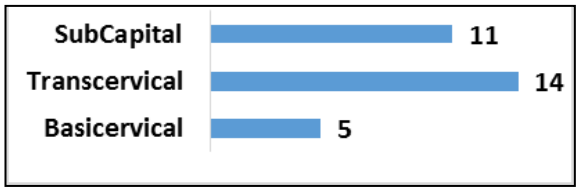

Fig 3: Fracture type

The average duration of surgery was 52 min (range, 35-67 min) with average blood loss of 210 ml (range, 90-450 ml). Average blood transfusion was 1.4 units including both preoperative and postoperative transfusions (range, 0 to 4 units). Mean duration of hospital stay was 7.1 days (5-11 days). There was one postoperative mortality, one patient had significant comorbidities associated including a diaphragmatic hernia with hypertension and type 2 Diabetes mellitus. The patient died on the 10th postoperative day due to comorbid illness.

Limb length discrepancy was associated in 8 cases out of 30 cases (26.7%). Shortening was seen in 6 cases the maximum shortening of 1cm in 4 cases, which was managed by a shoe raise. Lengthening of 1 cm was seen in 2 cases.

The complications that occurred were a total of 6 in 30 patients, amounting to 20%. Two patients had a deep infection which they managed by surgical debridement of the wound and aggressive antibiotic therapy according to culture and sensitivity reports, and the patients recovered from the infection but had a delayed functional recovery according to the Harris hip score. One patient had a superficial infection which was managed by antibiotic therapy according to culture and sensitivity and frequent dressings.

Two patients developed a dislocation of the operated hip prosthesis post surgery during the follow up period which was due to inability to follow the given instructions about the mobilization of the joint. The dislocations occurred due to flexion of the hip joint beyond 90 degrees and resulted in a posterior dislocation of the prosthesis. These were managed by open reduction and relocation of the prosthesis in the acetabular cavity.

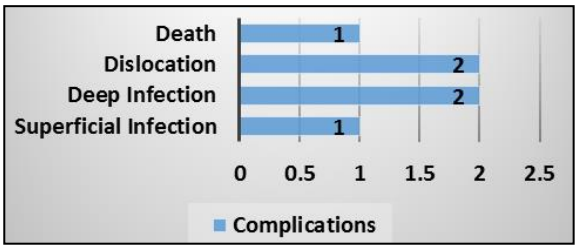

Fig 4: Complications

One patient was lost to follow up after one month as the patient died due to causes unrelated to the surgery.

At the final follow-up of 6 months the mean Harris hip score was 88.25 ±(5.23 SD) ranging from 66 to 93. 14 patients (50%) rated excellent, 12(42.8%) patients rated good, 1 patient (3.6%) rated fair and 1 patient (3.6%) rated poor.

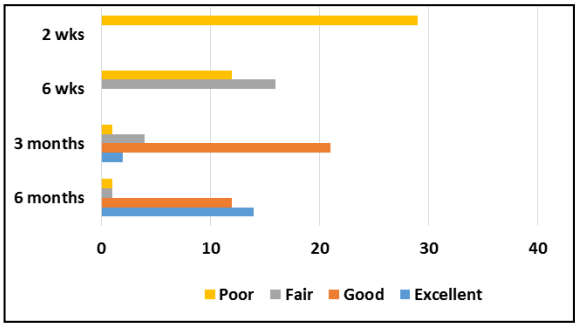

Fig 5: Post op Harris hip scores

Bar chart showing comparison of post operative grades of Harris Hip scores of the patients.

Table 2: Mean values of Harris hip scores of the patients post-operatively

Harris Hip Score (100)	Mean	SD	p-value
Post-op	41.4	7.0	
2wks	55.0	15.0	<0.05
6wks	69.4	6.8	<0.05
3months	84.14	6.58	<0.05
6 months	88.25	5.25	0.578

Table 2 showing Mean values of Harris hip scores of the patients post-operatively and then at consecutive follow ups along with their standard deviations and p-value. There is significant increase in Harris Hip Score till 3 months postoperatively.

There was no incidence of stem subsidence, acetabular erosion, acetabular protrusion, or heterotopic ossification in any of the patients during the follow up period.

Fig 5: Preoperative X-ray

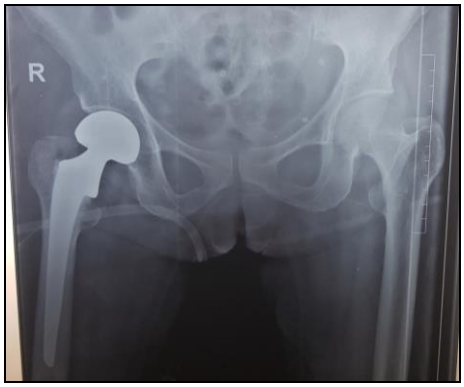

Fig 7: Post-operative X-ray

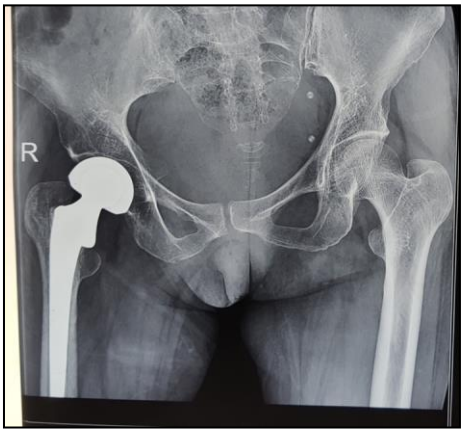

Fig 8: Follow up X-ray at 6 months

Fig 9: showing Scar mark at 6 month follow up

Fig 10: showing Flexion at the affected hip

Fig 11: showing external rotation at the affected hip

Fig 12: showing abduction and adduction at the affected hip

Discussion

Fracture neck of femur one of the most common factors in the elderly population following a trivial trauma. Limited an unprotected but supply to the femoral head, we intracapsular location and severe trabecular atrophy of the femoral neck are the factors that enable fracture healing and lead to osteonecrosis and late segmental collapse of the femoral head. Hemiarthroplasty involves replacing the femoral head with a prosthesis while retaining the natural acetabulum and the acetabulum cartilage. The aim of hemiarthroplasty for fracture neck of femur has been the early rehabilitation of patients with various comorbidities.

The mean age of cases with femoral neck fracture in the study was 67.2 years, ranging from 60 years to 82 years, which was comparable to other studies. Bansal *et al.* [7] in the study found an average age of 65 years in 25 patients with a fracture neck of femur treated with bipolar hemiarthroplasty. Ponraj *et al.* [3] reported an average age of 65 years in their study of 30 patients with fracture neck of femur treated with bipolar hemiarthroplasty. Tuteja *et al.* [8] reported an average age of 63.5 years. Fractures of the femoral neck are common in the older population due to poor bone stock and osteoporosis.

The gender distribution of the cases was 18 females and 12 males amounting to 60% and 40% respectively, which is compatible to other studies. Ponraj *et al.* [3] found similar distribution of cases amongst both genders with 63% females and 37% males in a study of 30 patients undergoing bipolar hemiarthroplasty for fracture neck of femur. Bansal *et al.* [7] reported 56% of females and 44% males in a study of 25 patients undergoing bipolar hemiarthroplasty fracture neck of femur.

In the present study out of 30 cases right side was involved in 17 cases amounting to 57% and the left side was involved in 13 cases amount into 43% of the cases. Raghavendra et al[9] in their study of 20 patients of intracapsular fracture neck of femur in elderly patients undergoing cemented bipolar hemiarthroplasty reported 50% involvement of both right and left side.

In the present study the most common anatomic fracture pattern was transcervical which was seen in 47% of the cases followed by subcapital in 36% of the cases and basicervical in 17% of the cases. Bansal *et al.* [7] in the study found 84% of patients with transcervical fracture, 12% patients with basicervical fracture and 4% patients with subcapital fracture.

At the final follow-up of 6 months the mean Harris hip score was 88.5 points to the standard deviation of 4.96. 14 patients rated excellent amounting to 50%, 12 patients rated good amounting to 42%, one patient rated fair and one poor, according to the harris hip score on the final follow up. These results are comparable to other studies. Sharoff *et al.* [10] reported 44.7 percent cases with excellent harris hip score at final follow up in a study of 43 patients undergoing bipolar hemiarthroplasty for fracture neck of femur.

Somashekar *et al.* [11] reported a mean harris hip score of 86.18 with a standard deviation of 12.18 in 20 patients undergoing bipolar hemiarthroplasty for fracture neck of femur, which is comparable to the current study. They reported excellent results in 47% patients, good in 41% patients which is comparable to the present study. Balan *et al.* [12] in their final follow up reported excellent results in 58.8% patients, good in 35.3% patients and fair in 5.9% patients in their study of 34 patients undergoing bipolar hemiarthroplasty for fracture neck femur.

In the present study most of the patients, amounting to 96%, were able to carry the daily activities of living by themselves and required minimum support of others at the final follow up. Similar results were reported by Mazen *et al.* [13], who reported that 89.2% patience either return to the functional level that they had before the fracture or used only Again, which they had not needed before.

The complications that occurred were a total of 6 in 30 patients, amounting to 20%. Similar complication rates were reported by Tuteja *et al.* [8] in their study of 24 patients undergoing bipolar hemiarthroplasty for fracture neck femur, with Infection in 1 patient, dislocation in 1 patient, mortality in 1 patient.

Limb length discrepancy was associated in 8 cases out of 30 cases (26.7%). Shortening was seen in 6 cases the maximum shortening of 1cm in 4 cases. Lengthening of 1 cm was seen in 2 cases out of 30 cases. The mean limb length discrepancy

0.13cm with a standard deviation of 0.51cm. Similar results were reported by Tuteja et al [8] who reported a mean limb length discrepancy of 0.47cm with a standard deviation of 0.66cm. Bansal *et al.* [7] reported limb lengthening in 2 cases out of 25 patients in their study. Ponraj *et al.* [3] also reported limb lengthening in 2 cases out of thirty patients with maximum lengthening of 1 cm.

Conclusion

In our study, all the patients had satisfactory functional outcome with majority having excellent to good outcome and all the patients resumed to their normal daily activity. To conclude bipolar prosthesis is a good and safe option in treating fracture neck of femur in the elderly (above 60 years) with good recovery and pain free function in-spite of having several co-morbidities and minimal complications.

References

1. Maruthi CV, Shivanna. Management of fracture neck of femur in elderly by hemiarthroplasty. Ind J Orthop. 2016; 2(2):170-180.
2. Sandhu HS. Management of fracture neck of femur. Ind J Orthop. 2005; 39(2):130-136.
3. Ponraj RK, Arumugam S, Ramabadran P. Functional outcome of bipolar hemiarthroplasty in fracture neck of femur. Sch. J. App. Med. Sci. 2014; 2(5D):1785-1790.
4. Lavelle DG. Fractures and dislocations of the hip. In: Canale ST, Beaty JH (eds). Campbell's operative Orthopaedics, 11th edition. Mosby:Penslyvania. 2008; 3271-85.
5. Keating J. Femoral neck fractures. In: Bucholz RW, Court-Brown CM, Heckman JD, Tornetta P. Rockwood and Green's Fractures in Adults,7thedition. Lippincott Williams and Wilkins: Philadelphia, 2010, 1561-96.
6. Bateman JE. Single assembly total limp prosthesis – Preliminary report. Orthop Digest, 1974, 2-15.
7. Bansal S, Jain S, Singhal RP. Management of fracture neck femur with bipolar arthroplasty. Int J Adv Multidiscip Res. 2016; 3:38-45
8. Tuteja SV, Manusukhani SA, Mukhi SR. Functional outcome with Bipolar Hemiarthroplasty as against total hip replacement in intracapsular fracture neck femur. Int J Med Res Health Sci. 2014; 3:945-953.
9. Raghavendra TS, Reddy BSJ, Jayaram j. Management of fracture neck of femur with cemented bipolar prosthesis. Ind J Clin Practice. 2014; 24:867-871
10. Sharoff L, Nazeer M, Unnikrishnan R. Functional outcome of cemented bipolar hemiarthroplasty in fracture neck of femur in elderly: A prospective observational study. Int J Med Res Health Sci. 2016; 5:70-76.
11. Somashekar, Krishna SV, Murthy SJN. Treatment of Femoral neck fractures: Unipolar versus bipolar prosthesis. Malay Orthop j. 2013; 7:6-11
12. Balan B, Shetty SK, Shetty A, Chandran R, Mathias LJ. Displaced intra-capsular neck femur fractures in the elderly: Austin Moore's prosthesis or cemented modular bipolar prosthesis. Int Arch Integ Med. 2016; 3:287-296.
13. Mazen S, Julien G, Riad F. Retrospective evaluation of bipolar hemiarthroplasty in fracture of proximal femur. North Asm J Med Sci. 2010; 2:419-425.