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FUNCTIONAL OUTCOME OF DISPLACED FEMORAL NECK FRACTURES IN ELDERLY MANAGED WITH BIPOLAR HEMIARTHROPLASTY: A PROSPECTIVE STUDY

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ABSTRACT We conducted a prospective study in which we included 30 patients with displaced intracapsular femoral neck fractures aged more than 55 years. The patients were managed with cemented or un-cemented Bipolar Hemiarthroplasty using lateral or posterior approaches. The outcome was studied using Harris Hip Scoring System and pain quantification was done using Visual Analogue Score (VAS). Results were excellent in 36.67% (11 patients), good in 40% (12 patients), fair in 20% (6 patients) and poor in 3.33% (1 patient). 76.66% patients had no pain at 6 months post-operatively while as 16.67% had mild pain, 3.33% had moderate pain and 3.33% had severe pain. 73.33% (22 patients) were ambulatory without any assistance 6 months post-operatively while as 23.33% (7 patients) were ambulatory with canes and only 3.33% (1 patient) was non-mobile. Surgical site infection occurred in 5 patients (16.67%) and significant limb lengthening of >2cm was seen among 3 patients (10%) post-operativley and 2 patients (6.67%) presented with prosthesis dislocation at follow-up. Bipolar Hemiarthroplasty has a very good functional outcome in displaced intracapsular femoral neck fractures in elderly with minimal complications.

KEYWORDS : Bipolar-Hemiarthroplasty, Fracture Neck of Femur, Harris Hip Score, Visual- Analogue-Score

INTRODUCTION

Fractures around the Hip constitute around 20% of the daily work burden of an orthopedic unit[1]. More than 50% of all fractures around the hip are intra-capsular femoral neck fractures. Undisplaced femoral neck fractures are universally treated with fixation. However, more than 85% of all intracapsular femoral neck fractures are displaced and can be managed with either reduction and fixation or some form of arthroplasty. With increasing life expectancy, the burden on health care due to these fractures are expected to increase further[2]. The economic burden of these fractures on society is tremendous. Significant morbidity and mortality is caused by these fractures, especially in geriatric population[3].

Different methods of treatment have been used for the management of displaced fractures of neck of femur. The treatment modalities vary from reduction followed by internal fixation with 6.5mm Cannulated Cancellous screws or Sliding Hip Screw to Hemiarthroplasty (unipolar or bipolar) to Total Hip Arthroplasty. Hemiarthroplasty is a commonly opted treatment modality for displaced fractures of the femoral neck in the elderly and has better functional outcome and lesser number of reoperation rate than internal fixation[4,5]. The initial surgical trauma may be more in Hemiarthroplasty but the chances of implant failure and reoperation rates are much lesser than internal fixation, hence making it cheap and economical[6,7].

Various factors help in deciding about the treatment modality, important ones being the age of the patient, preference of the operating surgeon, patients' financial status, acetabular arthritis[8]. The aim of our study was to assess the functional outcome of Bipolar hemiarthroplasty in intracapsular femoral neck fractures in elderly patients, admitted to the Department of Orthopedics Govt; Medical College, Jammu from June, 2016 to July, 2018.

MATERIALS AND METHODS

We studied 30 patients in our Prospective study, among which 20 were females and 10 were males; and were admitted in the department of Orthopedics Government Medical College Jammu from June, 2016 to July, 2018. All the patients were admitted with displaced intracapsular femoral neck fractures. The patients who were above 55 years of age, irrespective of sex, were included in our study. All patients who were below 55 years of age or with associated fractures of lower limbs or any deformities were excluded from our study. The study subjects were fully informed about the study, the interventions planned and the possible complication profile. All the patients gave written consents before taking part in the study.

The demographic particulars, detailed history, and relevant local and systemic examinations of all the patients who were willing to participate in the study were recorded in a proforma and the patients were subjected to X-ray of pelvis with both proximal femurs (anteroposterior view), involved Hip with proximal femur (Anteroposterior and lateral views). Analgesics were given and patient was advised complete bed rest and advised physiotherapy to prevent deep vein thrombosis and pressure sores. Traction was not used. All necessary blood investigations, Chest X-ray and ECG were done for fitness of the patient from anesthesia point of view.

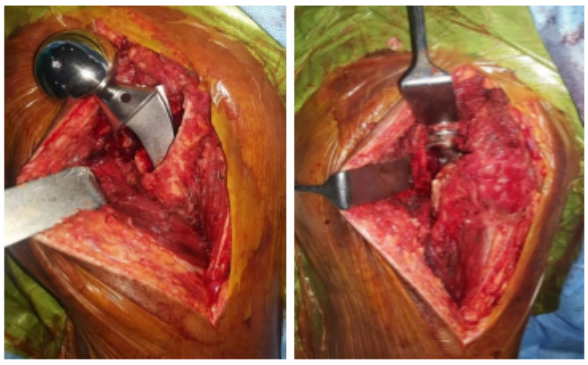
All the patients were operated within 5 days of admission to the hospital. All patients were given a single intravenous pre-operative anti-biotic dose of Cefuroxime 1.5g within half an hour of the surgery. Lateral and posterior approaches were used for surgery. Cemented as well as uncemented bipolar prosthesis were used. Inj Cefuroxime 1.5 g intravenous IV BD and inj amikacin 500 mg IV BD were given for 3 days post-operatively. Antiseptic dressings were done using spirit and betadine on second, fifth and seventh post-operative days. Drain was removed after 48 hours of surgery. The patients were mobilized after 48 hours after surgery with the assistance of walker.

SURGICAL PROCEDURE

Spinal or General anesthesia was used for performing surgery. Bipolar Hemiarthroplasty was performed in all the patients included in the study. Among 30 patients, lateral approach was used for surgery in 33.33% (10 Patients) and posterior approach was used in 66.67% (20 Patients). Among the 30 prostheses used, 13.33% were uncemented (04 patients) and 86.67% (26 patients) were cemented.

The patient was placed in a lateral position with affected side facing upwards. A lateral or posterior approach was used. The skin incision was given over lateral or posterolateral aspect of hip. Subcutaneous tissue, along the skin incision, was divided. Short external rotators and posterior edge of gluteus medius were exposed. The short external rotators were tagged and divided. Exposed portion of the capsule was divided. By flexing, adducting and internally rotating; the hip was dislocated posteriorly. Osteotomy of the femoral neck was performed and the femoral head was removed using a cork screw. The proximal femur was exposed by internally rotating the femur and pushing the femur proximally. A box osteotome was used to remove remaining portion of lateral aspect of femoral neck. Reaming of proximal femur was done. Cement was introduced in case of cemented stem prosthesis. Bipolar prosthesis was introduced. Head of the prosthesis was reduced into the acetabulum. Suction drain was put into place. Soft tissue was closed back in layers. The patients were put on intravenous antibiotics for 3 days post-operatively. Anti-septic dressings were done at 2nd, 5th and 7th post-operative days. Drain was removed after 48 hours of

surgery. The patients were mobilized 48 hours post-operatively using a walker.



FOLLOW-UP

The patients were followed up post-operatively in OPD at 6 weeks, 3 months and 6 months. Pain evaluation was done at follow-up using Visual Analogue Score (VAS) as in **Table 1.**

Table 1: ***Severity of pain according to VAS***

Severity of pain	No Pain	Mild Pain	Moderate Pain	Severe Pain
Score	0	1-4	5-8	>8

Harris Hip Scoring was used to evaluate the outcome of patients at each follow-up. At every follow-up the patients were thoroughly evaluated for any complications. Mobility status of the patients was also checked at every follow-up. On the basis of mobility the patients were divided into Three Groups.

Pre-operative Radiograph

Post-operative Radiograph

Group 1 included patients who were able to walk without any assistance (Independent Mobile) , Group 2 included patients who were mobile with the support of canes (Cane dependent Mobile) and Group 3 included those who were not mobile at all (Non-Mobile).

None of our patients were lost to follow-up and none died till the completion of the study.

OBSERVATIONS AND RESULTS

Lateral and posterior approaches were used for the surgery and all the patients who presented with dislocation during follow-up were operated using posterior approach **(Table 2).**

Table 2: ***Surgical approaches, dislocation rates and average blood loss***

Approach Used	Number Of Patients	Percentage	Number Of Dislocations	Avg. Blood Loss
LATERAL	10	33.33%	0 (0 %)	386 ML
POSTERIOR	20	66.67%	2 (10%)	430 ML

We used both cemented as well as un-cemented Bipolar prostheses among which 86.67% were cemented and 13.33% were un-cemented **(Table 3).**

Table 3: ***Cemented or un-cemented prostheses***

Type of prosthesis	Number	Percentage
Cemented	26	86.67%
Uncemented	04	13.33%

Using VAS for quantifying pain, at 6 months follow-up 76.67% patients had no pain, while as only 3.3% had severe pain. Mild pain was seen in 16.67% patients and moderate pain among 3.33% patients. **(Table 4)**

Table 4: ***Evaluation of pain using Visual Analogue Score (0-10)***

Follow-up period	No Pain (0)	Mild Pain (1-4)	Moderate Pain (5-8)	Severe Pain (>8)
6 weeks	08 (26.6%)	13 (43,33%)	06 (20%)	03 (10%)
3 months	16 (53.3%)	10 (33.33%)	02 (6.67%)	02 (6.6%)
6 months	23 (76.6%)	05 (16.67%)	01 (3.3%)	01 (3.3%)

We used Harris Hip Score for studying the functional outcome at a mean follow-up of 6 months after surgery. We achieved Excellent results in 36.67% (11 patients), Good results in 40% (12 patients), Fair results in 20% (6 patients) and poor results in only 3.33% (1 patient). **(Table 5)**

Table 5: ***Functional Outcome using Harris Hip Score at 6 months***

FUNCTIONAL OUTCOME	NUMBER OF PATIENTS	PERCENTAGE
EXCELLENT	11	36.67%
GOOD	12	40.00%
FAIR	06	20.00%
POOR	01	03.33%

73.33% of the patients were ambulatory without any assistance (Independent Mobile) 6 months post-operatively while as 23.33% were ambulatory with canes (Cane dependent mobile) and only 3.33%(1 patient) was non-mobile. **(Table 6)**

Table 6: ***Mobility evaluation at follow-up***

FOLLOW-UP PERIOD	INDEPENDENT MOBILE	CANE DEPENDENT MOBILE	NON-MOBILE
6 WEEKS	5 (16.67%)	22 (73.33%)	03 (10%)
3 MONTH	15 (50%)	13 (43.33%)	02 (6.6%)
6 MONTH	22 (73.33%)	07 (23.33%)	01 (3.3%)

Most frequent complications encountered were Surgical site infections, Limb lengthening and prosthesis dislocation **(Table 7)**. Five patients (16.67%) developed surgical site infection which was managed with serial antiseptic dressings and intravenous antibiotics according to the culture and sensitivity report of the discharge. Limb lengthening of >2cm occurred in three patients (10%). They were given appropriate shoe raise on the other side. Prostheses dislocation occurred among 2 patients. The dislocation occurred in both the patients due to fall. Both the patients had been operated using posterior approach. The patients reported to the orthopedic emergency immediately following dislocation. Closed reduction was done under anesthesia and adequate muscle relaxation followed by bed rest for 6-12 weeks.

Table 7: ***Post-Operative complications***

Post-OP complications	Number	Percentage
Surgical Site Infections	05	16.67%
Lengthening (>2 cm)	03	10%
Prosthesis Dislocation	02	6.67%

DISCUSSION

The main goal of the surgical treatment of the femoral neck fractures in elderly is to facilitate early return to pre-injury functional status with minimal complications. Management of the femoral neck fractures, in

the elderly, with Bipolar Hemiarthroplasty has shown impressive results.

In our study, we used Bipolar Hemiarthroplasty (Cemented or Uncemented) via posterior or lateral approaches in femoral neck fractures in elderly population. We studied 30 patients in our Prospective study, among which 20 were females and 10 were males; and were admitted in the department of Orthopedics Government Medical College Jammu from June, 2016 to July, 2018. All the patients were admitted with displaced intracapsular femoral neck fractures. We achieved Excellent to good results in 76.67% of our patients with an average Harris Hip Score of 84.43 points. The results we achieved were excellent in 36.67% (11 patients), good in 40% (12 patients), fair in 20% (6 patients) and poor in 3.33% (1 patient) as judged by using Harris Hip Score, at 6 months follow-up.

Pain analysis using VAS determined that 76.66% patients had no pain at 6 months post-operatively while as 16.67% had mild pain, 3.33% had moderate pain and 3.33% had severe pain.

73.33% (22 patients) were ambulatory without any assistance, 6 months post-operatively while as 23.33% (7 patients) were ambulatory with canes and only 3.33% (1 patient) was non-mobile. The average blood loss was lesser in lateral approach as compared to the posterior approach **(Table 2)**. Surgical site infection occurred in 5 patients (16.67%) and significant limb lengthening of >2cm was seen among 3 patients (10%) post-operativley and 2 patients (6.67%) presented with prosthesis dislocation at follow-up. Both the patients with prosthesis dislocation had been operated using posterior approach. The prosthesis dislocation occurred among 10% (2 patients) in which posterior approach was used, while none of the patients operated using lateral approach dislocated.

In the previously reported research, Giliberty et al (1983) observed a mean Harris hip score of 84.81 points. Mannarino et al (1986) noticed a mean Harris hip score of 84.7 points. Lausten et al (1987) had achieved 75% excellent to good results in their study. Lestrange (1990) had achieved 70.8% excellent to good results. Lortat et al (1992) found 94% satisfactory results and substantially better clinical and Radiological results as compared with Moore's prosthesis and results comparable to total hip replacement. Surya Bhan (1993) observed 90.6% excellent to good results with bipolar hemiarthroplasty. The results of our study are very much comparable to the previous series of research.

CONCLUSION

Bipolar Hemiarthroplasty has a very good functional outcome in displaced intracapsular femoral neck fractures in elderly with minimal complications. Hence, we recommend it for intracapsular displaced fractures of neck of femur in elderly patients.
A lateral approach should be preferred over a posterior approach owing to the lesser blood loss and a lesser incidence of prosthesis dislocation.

LIMITATIONS

Limited number of patients and a Shorter follow-up

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