

Evaluation of Hemiarthroplasty by Bipolar Prosthesis in Displaced Femoral Neckfracture

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Cite this as: BMCJ 2021; 7 (1): 20-23

Received: 12 January 2020
Accepted: 25 November 2020

Abstract

Background: Fracture neck of femur typically occurs in elderly patients from low energy fall from standing height. There is an increased risk of mortality and morbidity in these patients. Surgery is mandatory to alleviate complications. Hemiarthroplasty is one of the surgical options of the femoral neck fracture. **Objective:** To evaluate the outcome of hemiarthroplasty by bipolar prosthesis in displaced femoral neck fracture. **Methods:** This quasi experimental type of study was carried out among the admitted patients in Barind Medical College Hospital (BMCH). A total 53 patients admitted in BMCH from January- 2018 to December-2019 with displaced femoral neck fractures were included in this study. All patients underwent hemiarthroplasty with bipolar prosthesis without cement. Final outcome were evaluated after 1 year of surgery and assessment of Harris Hip Score. **Results:** Harris Hip Score was excellent in 5 cases, good in 38 cases, fair in 9 cases and poor in only 1 case. **Conclusion:** Hemiarthroplasty by bipolar prosthesis is one of the effective treatment of displaced femoral neck fracture.

Key words: femoral neck fracture, Hemiarthroplasty.

Introduction

Femoral neck fractures predominantly occur in the elderly, typically result from low energy fall and may be associated with osteoporosis. But in young patients fractures are typically result from high energy mechanism and associated with other injuries.¹ In older patients, femoral neck fractures are associated with higher morbidity and mortality.²

Treatment of femoral neck fracture depends upon the type of fracture. There is still controversy about the choice of treatment of displaced intracapsular femoral

neck fractures.³ Internal fixation is associated with less operative trauma but later complications such as displacement of fracture, nonunion and avascular necrosis which may require revision.^{3,4} Hemiarthroplasty has been established as the treatment of choice for displaced femoral neck fractures.^{3,5} Now a days bipolar prosthesis has been used. This device consists of two articulating surfaces: one between the femoral head and polyethylene liner and another between the metallic shell and acetabulum.⁶ This biarticular design is thought to be associated with less acetabula wear than the

unipolar prosthesis. Evidence suggests that the use of cement prevents loosening by improving prosthesis anchorage to the bone. Loose prosthesis can cause pain, delay patient mobilization and require further surgery. However, the use of cement can complicate revision surgery and may cause severe cardiovascular complication.⁷ The objective of the study was to evaluate the outcome of hemiarthroplasty of hip by bipolar prosthesis.

Methods

This quasi-experimental study was carried out in the Department of Orthopaedic Surgery of Barind Medical College Hospital. The patients admitted in BMCH with displaced femoral neck fracture were the study population. The total of 53 admitted patients from January 2018 to December 2019 were included in this study. Patients with preexisting hip pathology, undisplaced fracture, unable to walk before fracture and fracture in young patient were excluded from the study. All the patients were operated under subarachnoid block. Acrylic (PMMA) bone cement did not use in any case in this study. Check x-ray was done to confirm the position of prosthesis. Then encourage partial to full weight bearing gradually over 4-6 weeks. All the patients were discharged on an average of 7 days postoperatively. The minimum follow up period was 1 year. In every follow up clinical and radiological evaluation were done for limb length discrepancy, thigh pain, gait pattern, ROM and periprosthetic loosening. Harris Hip Score (HHS)⁸ evaluation was done in each follow up.

Results

In this study the mean age of the patients was 60.13 years: the lowest one was 44 years and the highest was 90 years. A total of 53 patients, 30 were males and 23 were females (Table-I). Majority of the patients, 41(77.4%) had history of fall and 12 (26.6%) patients had a history of

road traffic accident.

Postoperative infections were noted in 2 patients and all were superficial infection. These were treated with intravenous antibiotics for 7-10 days then switched over to oral antibiotics for another 2-3 weeks. In this study, there was no incidence of DVT, PE or cerebrovascular accident.

There was no dislocation, periprosthetic loosening or acetabula erosion in this study. One patient developed periprosthetic fracture due to fall which was internally fixed with wiring. One patient developed leg lengthening of 1.5 cm but he managed well with shoe modification. Mean Harris Hip Score was 27.8 preoperatively which increased to 44.2 at 6 weeks, 59.6 at 3 months and 80.5 at the end of 1 year. Harris Hip Score was excellent in 5 cases, good in 38 cases, fair in 9 cases and poor in only 1 case at the end of 1 year (Table-II).

Discussion

The treatment of fracture neck of femur is always operative. Surgical option depends upon the type of fracture, age of patient, quality of bone, ambulatory status of the patient, associated medical illness and socioeconomic condition. Hemiarthroplasty is one of the treatments of fracture neck of femur. Although there are other options like internal fixation and total hip replacement (THR). Hemiarthroplasty is easier to perform than internal fixation and quicker than THR.⁹ Elderly patient with fracture neck of femur has a good long term outcome with THR.⁷ However, the THR surgery is costly as per our socio-economic context. There is increasing evidence that has been supporting arthroplasty as superior to internal fixation in displaced femoral neck fractures.^{10,11} During closed reduction further injury to retinacula vessel which jeopardizes the vascularity leading to

AVN or nonunion. Patient with severe osteoporosis allowed the patient to bear weight after 6 weeks without use any bone cement. There is no significant functional difference with other patients. Prashanth *et al.* (2017)² also found similar results. Harris Hip Scores of the patients in this study suggests that Hemiarthroplasty by bipolar prosthesis is an effective treatment of displaced femoral neck fracture.

Table-I: Demographic profile of the patients (n=53)

Characteristics	N(%)
Age (years)	
30-49	7 (13.2)
50-59	16 (30.2)
60-69	18 (34.0)
>70	12 (22.6)
Gender	
Male	30 (56.6)
Female	23 (43.4)
Side of fracture	
Right	28 (52.8)
Left	25 (47.2)

Table-II: Harris Hip Score at various stages of patient management

Score	Time of patient management				
	Preoperative N(%)	At 6 weeks N(%)	At 3 months N(%)	At 6 months N(%)	At 1 year N(%)
90-100(Excellent)	00(0.0)	00(0.0)	00(0.0)	03(5.7)	5(9.4)
80-89 (Good)	00(0.0)	00(0.0)	00(0.0)	34(64.1)	38(71.7)
70-79 (Fair)	00 (0.0)	00(0.0)	48(90.6)	15(28.3)	9(17.0)
< 70 (Poor)	53(100.0)	53(100.0)	05(9.4)	1(1.9)	1(1.9)

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