Evaluation of Replacement Hemiarthroplasty of Femoral Neck Fracture by Bipolar Prosthesis through Lateral Approach

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Abstract

Background: Hemiarthroplasty (HA) is the most common treatment for displaced femoral neck fracture in the elderly.

Objective: To find out the outcome of bipolar prosthesis through lateral approach for the treatment of femoral neck fracture.

Methods: This prospective observational study was conducted in the Department of Orthopedic Surgery, DMCH and NITOR, Dhaka from January 2006 to December 2007. Twenty patients with femoral neck fracture admitted for surgery were enrolled in this study. Patients were followed up at OPD after 6 weeks, 18 weeks, 30 weeks and 48 weeks of surgery. They were followed up clinically and radiologically. Harris hip score was used to evaluate the outcome.

Results: The mean age of the patients was 65 years varied from 45 years to 84 years. The most common age group was between 65 to 74 years, which comprised of (45%) patient. Left side was affected in 12 (60.0%) and right side in 8 (40.0%) cases. The most common cause of injury was fall on the slippery ground (50.0%). Three patients had hypertension. 15 (75.0%) patients attended OPD of Dhaka Medical College and OPD of NITOR within 3 weeks of the injury and the remaining 5 (25%) attended between 3 weeks to 12 weeks. No abnormality was detected in 16 (80.0%) patients. Among 3 (15.0%) cases, a radiolucent line was observed along the femoral stem. Sinking of the prosthesis was found in only one patient. During the initial follow up almost all patients complained of mild pain. But at final follow up 6 patients (30%) had painless hip and 8 patients (40%) complained of slight pain on walking long distance. 5 patients (25%) had occasional moderate pain and 1 patient constant moderate pain needed medication for relieve.

Conclusion: Outcome of bipolar prosthesis through lateral approach for the treatment of femoral neck fracture was satisfactory.

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Introduction

Fractures of the neck of the femur, a common fracture in the elderly, have always presented great challenges to orthopaedic surgeons.[1] Replacement hemiarthroplasty by using unipolar Austin Moore, Thompson prosthesis or bipolar prosthesis can be considered as one of the acceptable means of treatment of displaced femoral neck fractured. Endoprosthetic replacement of the femoral head can provide early ambulation, weight bearing, restoration of stability, walking activities and reasonably good range of movement to accomplish the functional activities such as squatting and sitting on prayer position.[2] The most significant problems in conventional one piece Moore or Thompson device were femoral stem loosening, acetabular erosion, intrusion of the prosthesis into pelvis and difficulties with total hip revision when the stem were cemented.[3] These factors led to the development of bipolar prosthesis introduced by Bateman.

The bipolar concept was born of the need to establish fixation of the stem in the femoral shaft, yet eliminate shear forces between the metallic prosthetic head and acetabular cartilage. Using bipolar prosthesis, in addition to early ambulation, weight bearing, and restoration of stability and walking activity, patients appeared to have less post-operative pain and greater range of motion (ROM). They also returned to unassisted activity more rapidly.[3]

Due to poor socio-economic condition, illiteracy, underdeveloped communication and nonavailability of orthopaedic centre, patient with femoral neck fracture attend the hospital delayed for days or months. They usually present with non-union, absorption of neck, a-vascular necrosis. More-over due to the lack of hospital facility, early scarcity of schedule, as well as poor condition, ideal basic principle of treatment by anatomic reduction and internal fixation is very often beyond our reach.

Again replacement hemiarthroplastly by Austin Moore prosthesis causes more pain, decrease ROM, acetabular erosion and loosening of femoral stem, intrusion of prosthesis into pelvis, difficulty with total hip revision when femoral stern were cemented.[3] To deal with all these problems, replacement arthroplasty by using bipolar prosthesis can be considered as one of the acceptable means of treatment of high femoral neck fracture in aged.

Considering the above facts, the results of herniarthroplasty with bipolar prosthesis has been evaluated in the present study.

Methods

This prospective observational study was conducted in the Department of Orthopedic Surgery, Dhaka Medical College Hospital (DMCH) and National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR), Dhaka from January 2006 to December 2007. Twenty patients with femoral neck fracture admitted for surgery were enrolled in this study. After taking written consent clinicoradiological examinations and all relevant investigations were completed for each patient. Patients were followed up at OPD after 6 weeks, 18 weeks, 30 weeks and 48 weeks of surgery. They were followed up clinically and radiologically. Harris hip score was used to evaluate the outcome.

Results

This prospective study comprises 20 elderly patients with fracture neck of the femur. The age of the patients varied from 45 year to 84 year. The average age was 65 years. The most common age group was between 65 to 74 years, which comprised of (45%) patient

(Table I). Out of 20 cases left side was affected in 12 (60.0%) and right side in 8 (40.0%) cases (Table II). The most common cause of injury was fall on the slippery ground (50.0%). The other causes were stumbling 5 (25%), followed by fall from rickshaw 3(15%) and direct trauma 2(10%) (Table III). Three patients had hypertension (Table IV). In this study 15 (75.0%) patients attended OPD of Dhaka Medical College and OPD of NITOR within 3 weeks of the injury and the remaining 5 (25%) attended between 3 weeks to 12 weeks (Table V). Out of 20 patients no abnormality was detected in 16 (80.0%) patients. Among 3 (15.0%) cases, a radiolucent line was observed along the femoral stem. Sinking of the prosthesis was found in only one patient (Table VI). During the initial follow up almost all patients complained of mild pain. But at final follow up 6 (30.0% patients had painless hip and 8 (40%) patients complained of slight pain on walking long distance. Five (25%) patients had occasional moderate pain and 1 patient constant moderate pain needed medication for relief (Table VII). At final follow up, 8 (40.0%) of the study subjects had excellent outcome, 7 (35.0%) had good outcome, 2 (10.0%) had fair outcome and 3 (15.0%) poor outcome. Satisfactory outcome was 15 (75.0%) considering excellent and good outcome as satisfactory and unsatisfactory outcome was 5 (25.0%) considering fair and poor outcome as unsatisfactory (Table VIII).

Table I: Demographic profile of the study subjects (N=20)

	Frequency (n)	Percentage (%)
Age (years)		
45-54	02	10.0
55-64	05	25.0
65-74	09	45.0
75-84	04	20.0
Mean ±SD	65.0 ± 11.4	
Gender		
Male	7	35.0
Female	13	65.0

Table II: Distribution of the study subjects according to affected side (N=20)

Side	Frequency (n)	Percentage (%)
Left	12	60.0
Right	8	40.0

Table III: Distribution of the study subjects according to causes of injury (N=20)

Causes of injury	Frequency (n)	Percentage (%)
Fall on the slippery ground	10	50.0
Stumbling	5	25.0
Fall from rickshaw	3	15.0
Direct trauma	2	10.0

Table IV: Distribution of associated medical problems (N=20)

Associated medical problems	Frequency (n)	Percentage (%)
Hypertension	3	15
Without associated medical problem	17	85
Total	20	100

Table V: Distribution of the study subjects by time interval between injury & hospital attendance (N=20)

Duration in weeks	Frequency (n)	Percentage (%)
Up to 3 weeks	15	75%
3 weeks to 12 weeks	5	25%

Table VI: Radiological outcome at final follow up of the study subject (N=20)

Radiological examination	Frequency (n)	Percentage (%)
Nothing abnormal	16	80.0
Radiolucent zone > 2 mm	3	15.0
Sinking of prosthesis	1	5.0

Table VII: Pain at final follow-up of the study subjects (N=20)

Pain status	Frequency (n)	Percentage (%)
No pain	6	30.0
Slight pain	8	40.0
Moderate pain (occasional)	5	25.0
Moderate pain (constant)	1	5.0

Table VIII: Final outcome of this series (N=20)

Outcome	Frequency (n)	Percentage (%)
Satisfactory	*15*	*75*
Excellent	8	40
Good	7	35
Unsatisfactory	*5*	*25*
Fair	2	10
Poor	3	15

Discussion

The present series which include 20 cases of femoral neck fracture in aged, treated with replacement hemiarthroplasty with bipolar prosthesis with a mean follow up period of 10.6 months (range 6 months to 12 months), show satisfactory result in 75% cases.

In this study, 13 (65%) were females and 7 (35%) were males. Similar sex incidence was observed by Austen in 1986 (77.5% females and 21.5% males), Gallinaro[4] in 1988 (79.6% females and 20.4% males), Mistry[5]in 1989 (70.0% females and 30.0% males), Nottage et al.[6] in 1990 (75.0% females and 25.0% males).

In the present study average age was 65 years, range 45-84 year. The most common age group was 65-74 years which constituted 45.0% of the series. This result corresponds to the series reported by Moshein et al.[7] in 1989

(range 58-92 year, average 74.2 years), Lausten et al.[8] in 1989 (range 47-99 year, average 77 years), Nottage et al.[6] in 1990(average 65 year, range 22-89 year) and Talukder[2]in 1995 (range 55-75 year, average 63 years). The most common causes of fracture neck of femur in the present series was minor trauma such as fall on slippery ground and stumbling which constitute 75.0% of cases. Fall from rickshaw and direct trauma totaled 25.0%.This is consistent with the study of Talukder.[2]

Pain is a subjective sensation and sensitivity varies from person to person. There is no definite method available to measure pain. In the present study 70% of patient had no or slight pain. This is similar to 85.0% reported by Moshein et al.[7]; 90% reported by Gallinaro et al.[4], and 88.4% reported by Labelle et al.[9] The slight difference probably due to their long term follow up.

At final follow up, 8 (40.0%) of the study subjects had excellent outcome, 7 (35.0%) had good outcome, 2 (10.0%) had fair outcome and 3 (15.0%) poor outcome. Satisfactory outcome was 15 (75.0%) [considering excellent and good outcome as satisfactory] and unsatisfactory outcome was 5 (25.0%) [considering fair and poor outcome as unsatisfactory]. The result is similar to other studies conducted at NITOR: Talukder[2] studied replacement hemiarthroplasty by Austin Moore prosthesis in femoral neck fracture in elderly on 16 patients with mean follow up of 9 months and 4 days with satisfactory result of 68.75% and Mistry[5] studied 30 patients with mean follow up to 13 months and 19 days with satisfactory result of 86.67%.

Conclusion

Outcome of bipolar prosthesis through lateral approach for the treatment of femoral neck fracture was satisfactory (75.0%). In this study 8 (40.0%) patients had slight pain, 5 (25.0%) had occasional moderate pain and 1 (5.0%) had constant moderate pain.

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