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Original Research Article

Study of Early Outcome of Austin Moore's Prosthesis in Fracture Neck Femur in Elderly

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ABSTRACT

Introduction: Femoral neck fractures, one of the most common injuries in the elderly and its prevalence has increased with improvement in life expectancy, increased incidence of osteoporosis, and changes inlifestyle leading to sedentary habits. In last four decades hip arthroplasty is evolved as the best treatment for intra capsular fracture neck of femur in elderly in terms of both short-term and long-term results.However, it is still not popular as a first treatment modality because of complications like dislocations and higher morbidity associated with the procedure and also cost. This study is design to gain a deeper understanding of the results and problems associated with this procedure and complications like thigh pain, stem loosening and peri prosthetic fractures.

Materials and Methods: A prospective study was carried out at G K General Hospital, Bhuj during the period of August 2019 to July 2020. 22 patients satisfying the inclusion criteria like Intra- capsular fracture of the neck of femur and aged above 60 years were included in the study.While patients with pathological fractures, arthritic changes involving the acetabulum, below 60 years of age, not willing for surgery and medically unfit for surgery were excluded from the study.

Results: Out of total 22 patients majority of patients (90.9%) had transcervical type of fracture. Commonest time of presentation of patients were after 72 hours and average delay in surgery after injury was 12 days.Early postoperative complications like shortening, superficial infection, deep vein thrombosis was seen. However, no late postoperative complications like loosening, dislocation, erosion, calcar resorption, protrusioacetabuli or periprosthetic fracture were found. Progressive improvement in Harris Hip Score seen at each follow up visit with average final score at one year was 84.53 with a maximum score of 93 and a minimum score of 65.8.

Conclusion: Hemiarthroplasty using Austin Moore prosthesis for fractures of the femoral neck provides freedom from pain, better range of movement and more rapid return to unassisted activity with an acceptable complication rate.

Keywords: Fracture neck femur, Hemiarthroplasty, Austin Moore prosthesis

INTRODUCTION

Femoral neck fractures, one of the most common injuries in the elderly, have always presented great challenges to orthopaedic surgeons. The prevalence of these fractures has increased with improvement in life expectancy, increased incidence of osteoporosis, poor vision, neuro-muscular in-coordination and changes in lifestyle leading to sedentary habits.

The prevalence of the fracture also doubles for each decade of life after the fifth decade [1]. The burden of this fracture and its sequelae continues to be on the rise as geriatric population in our society is going to increase in next decades[2]. The goal of treatment of femoral neck fractures is restoration of pre-fracture function without associated morbidity[3].

This study is design to gain a deeper understanding of the results and problems associated with this procedure and to evaluate the Austin Moore's prosthesis offers any distinct advantages in reducing the complications of thigh pain, stem loosening and periprosthetic fractures.

MATERIAL AND METHODS

A prospective study was carried out at G K General Hospital, Bhuj during the period of August 2019 to July 2020. Permission from Human Research Ethics Committee was taken before starting the study. Patients satisfying the inclusion criteria like Intra- capsular fracture of the neck of femur and aged above 60 years were included in the study.While patients with pathological fractures, arthritic changes involving the acetabulum, below 60 years of age, not willing for surgery and medically unfit for surgery were excluded from the study. All patients selected for the study were inquired and examined according to protocol and associated injuries, if any, were noted and investigations carried out in order to evaluate fitness for anesthesia.

Regular follow up of all cases was done at 6 weeks, 3 months, 6 months, 9 months and one year. At each followup, patients were evaluated clinically using the Harris Hip Score and radiologically with appropriate X-rays. Harris Hip Score[6] consist of 100 points with four main domains which includes Pain relief 44 points), 2. Function which contains Gait &Activity (47 points), 3. Absence of deformity (4 points), 4.Range of motion (5 points).

RESULTS

The results for Harris Hip score are rated as : Excellent:90-100, Good:80-89, Fair:70-79 and Poor:<70.

Table 1 shows 5 patients (22.72%) in 60-70 years age, 13 patients (58.5%) in 71 to 80 years, 4 patients (18.18%) in >80 years age group. 59% patients were females. 76.5% patients were in self fall and 22.72% patients were in RTA. Time to presentation after injury was divided in < 24hrs, 24hrs-72hrs, 72hrs-1wk, >1week groups.

Table-1: Demographic data of patients

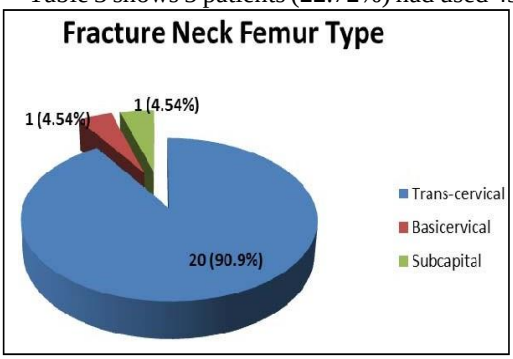
Patient Distribution	No. of patients	Percentage
Age (years)		
60–70	5	22.72
71-80	13	58.5
>80	4	18.18
Gender		
Male	10	45.45
Female	12	59
Laterality of fracture		
Right	10	45.45
Left	12	59
Mode of Injury		
Slipping/ Tripping	17	76.5
RTA	5	22.72
Time to presentation after injury		
<24 hrs	5	22.72
24hrs–72hrs	6	27.27
72hrs–1wk	5	22.72
>1week	6	27.27

Table 2 shows most of the patients 45.45% had hypertension.

Table-2: Systemic co-morbidities in patients

Co-morbidities	No. of patients	Percentages
Heart Disease	6	27.27
Hypertension	10	45.45
Diabetes	2	9.09
COPD	3	13.63
Knee osteoarthritis	1	4.5

Table 3 shows 5 patients (22.72%) had used 45mm



prosthesis and only 1 patient (4.5%) had used 53mm prosthesis.

Table-3: size of prosthesis used

Size	No. of patients	Percentages
39 mm	3	13.63
41 mm	2	9.09
43 mm	4	18.18
45 mm	5	22.72
47 mm	3	13.63
49 mm	2	9.09
51 mm	2	9.09
53 mm	1	4.5

Table 4 shows most of the patients had 500-750ml blood loss. 3 patients have post operative hypotension. No patients had prei prosthetic fracture. 2 patients had shortening of limb, 2 patients had superficial infection and 1 patient had deep vein thrombosis.

Table-4: Peri operative and early post- operative complication

Complications	No. of patients	Percentages
Peri operative		
Blood loss		
<500 ml	8	36%
500-750ml	11	49.50%
>750ml	3	13.63%
Post-operative hypotension	3	13.63%
Peri prosthetic fracture	0	0%
Early post-operative		
Shortening	2	9.09%
Superficial infection	2	9.09%
Deep vein thrombosis	1	4.5%

Figure 1 shows 20 patients (90.9%) had trans cervical fracture, 1 patient (4.54%) had basi-cervical fracture and 1 patient (4.54%) had sub capital fracture.

Fig-1: Radiological Type of Fracture Neck Femur

Figure 2 shows average Harris hip score at 6 weeks is 57.18 at 3 month 67.66. at 6 months, 77.53, at 9 months 82.64, at 1 year 84.53.

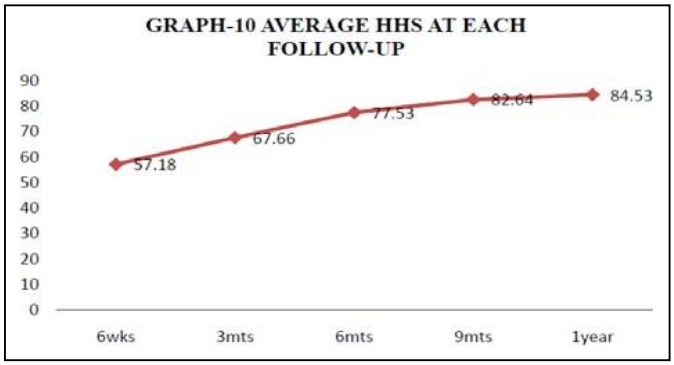


Fig2: Average Harris Hip Score at each follow up visit

DISCUSSION

The final goal in replacement surgery of fracture neck femur is early return to daily activities to pre fracture levels. This is particularly applicable to the elderly age group where complications related to prolonged immobilization need to be prevented. The aim of assessing age is to estimate the patient's mean survival time and the irability to comply with rehabilitation protocol. The mean age of the patients in the present study was 74.77 years, which is lower to those reported in Western literature but higher than other Indian series.

Gender wise distribution shows that female had slightly higher fracture rate. This is due to the lower peak bone mass and postmenopausal bone loss in women[7].Women have a skeleton that adapts less well to ageing by periosteal apposition. More women have bone size and volumetric BMD reduced to below a critical level at which the loads on the bone are near to, or greater than, the bone's structural ability to tolerate them. [8,9] Majority of our study patients (90.9%) sustained the injury due to a trivial trauma like tripping or slipping. Falls are a common event, particularly among the elderly.

Epidemiologic studies have identified a number of risk factors for this like weakness, balance deficit, gait disorder, visual deficit, etc.[7].Most of such injuries can be

classified as" indirect" trauma. After injury, 31.8% presented for treatment.

After one week, all the patients were taken up for the surgical procedure between the 3rd and 45th day after the trauma, the average delay to surgery being 12 days. Delay in taking up for surgery was usually for optimizing the medical condition of the patient and to achieve limb length in patients who presented late and had shortening of more than 2 cm.

Among all, 72.72% of the patients had at least one medical co-morbidity, which is lower than the 83.3% patients in the series by Noor *et al* [10] more than the 64.5% reported by Saxena *et al*. [11]Hypertension was found to be the most common co-morbidity seen in 45.45% of the study patients. It was observed that the postoperative rehabilitation of patients was significantly affected by the presence of the above co-morbidities.

In 5 patients 45 mm prostheses were used. This was followed in frequency by 43 mm (4 cases), 41 mm, 49 mm and 51 mm(2 cases each) prostheses. The commonly used sizes in the series by Jadhav *et al* was also 43 mm and 41 mm. [12] In present study, most of the patient had blood loss below 500ml.Only 13.6% had> 750 ml of blood loss leading to hypotension requiring blood transfusion. Other complication like peri prosthetic fracture,to secure the fixation. Weinrauch *et al* (2005)m [13] and Parker *et al* (2010) [14] ,have reported a statistically significant increased incidence of peri prosthetic fractures in uncemented Austin Moore prosthesis compared to cemented Thompson prosthesis. Superficial infection in the form of a wound dehiscence was seen in two patients (9.09%) one of who was a diabetic. There were no late postoperative complications like loosening, dislocation, erosion, subsidence, protrusioacetabuli or peri prosthetic fracture.

In present study, the final Harris Hip Score as evaluated at one year follow-up averaged 84.53 with the maximum score being 93 and the minimum score being 65.8. Overall,4 patients (18%) achieved Excellent result, 13 patients (59%) achieved good result, 3 patients (13.6%) achieved fair result and 2 patients (9.09%) achieved poor result. Overall, 77.27%of the patients achieved an excellent or good result. It is comparable with other standard studies of uncemented hemiarthroplasty with Austin Moore prosthesis like Dhar *et al*[15] and Moore *et al*. [16]. Results of present study suggest that Austin Moore prosthesis gives a better functional, lesser pain and improved gait function out come by providing better primary anchorage of the prosthesis. A good stable fit allows early mobilization of patients.

Evaluation of satisfaction level of patients shows that ,8 patients (36.36%) were 'very satisfied', 10 (45.45%) were 'fairly satisfied' and 4 (18.18%) were 'not satisfied'. The level of satisfaction being a subjective assessment did not correlate well with the Harris Hip Score which was an objective assessment. Patient were also evaluated radiologically pre and post operatively for metaphyseal fill.

The types of implantation errors in this study, as assessed by the methods described by Sharif and Parker[17]which included inadequate length of neck remnant(<12mm),inadequate calcar seating (>1 mm), difference in prosthetic head size compared to contra lateral head (up to 2 mm),2 patients(9.09%)had inadequate neck length as did another 2 patients (9.09%) in whom calcar seating was found to be inadequate. There was no error in selecting prosthesis of the correct head size.

In conclusion, Hemiarthroplasty using Austin Moore prosthesis for fractures of the femoral neck provides freedom from pain, better range of movement and more rapid return to unassisted activity with an acceptable complication rate. However, in present study only one year follow up could be done. The long-term results using Austin Moore prosthesis needs further study for a longer period in a larger sample with a direct comparison between the cemented versus uncemented groups require to produce more reliable results.

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