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A study to assess functional outcome of transcervical neck femur fracture managed with Bipolar Hemiarthroplasty in tertiary care centre

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ABSTRACT-Background: As per surveys conducted in the past, hemiarthroplasty is considered to be the most accepted treatment option by surgeons. Professionals supporting hemiarthroplasty consider that the rate of nonunion is increased with age. This higher need for early reoperation is associated with fixation making replacement a more dependable and proven choice of treatment for the geriatric population. **Method:** Total 50 elderly patients were enrolled and operated after being put into lateral decubitus position by the lateral approach or posterior approach of Moore. Modified harris hip score (HHS) was used for analysis of functional outcome, X ray for radiological and patients' pain was assessed by VAS scoring and finally all three parameters compiled and analyzed. **Results:** The mean age of patients was 68.58 years. Majority of patients had Garden grade III (62%) and right sided hip fractures (72%). On immediate post-operative assessment, 45 of the 50 patients had fair outcome. At 6 and 12 weeks, 41 and 44 patients respectively had good outcome by HHS. At 6-month follow-up, 33 patients had good outcome while 13 patients had excellent outcome and two patient had died. There was significant decrease in the VAS score till 6-month follow-up. **Conclusion:** Patient with fractures of the femoral neck get more pain free interval and more rapid return to unassisted activity after bipolar hemiarthroplasty with an acceptable complication rate.

Keywords: Femoral neck fractures; Elderly; Hemiarthroplasty; Bipolar prosthesis; Harris hip score; VAS score

I. INTRODUCTION

Femoral neck fractures are frequent injuries in the patient population of every trauma center and have a high incidence in the general population. Paralleling trends of demographic forecasts, their incidence will continue to rise in the future. Especially in the elderly, femoral neck fractures represent a significant health care problem and have enormous impact on health insurance costs. Therefore, the appropriate treatment of femoral neck fractures is mandatory.[1]

The prevalence of femur neck fractures has increasing with increased incidence of osteoporosis, difficulty vision in elderly, poor neuro muscular coordination, life style changes, sedentary lifestyle, improvement in life expectancy. Our treatment goals for femoral neck fractures are rapid return to a satisfactory functional status with minimization of mortality, morbidity and the need for re-operation.[2]

There is still a dilemma over either internal fixation or arthroplasty in the treatment of fracture neck of femur in geriatric age group.

As per surveys conducted in the past, hemiarthroplasty is considered to be the most accepted treatment option by surgeons. Professionals supporting hemiarthroplasty consider that the rate of nonunion is increased with age. This higher need for early reoperation is associated with fixation making replacement a more dependable and proven choice of treatment for the geriatric population. Hemiarthroplasty causes speedy recovery of mobility and delayed issues of loosening and wear are of lower concern in patients with a short lifespan.[3]

However, despite proper anatomic alignment of fracture and most rigid fracture fixation, many patients failed to regain good functional outcome. Non-union of the fracture site, avascular necrosis of the femoral head and the degree of fracture commination affected results in most of the patients. Nonanatomic reduction and inadequate fixation cause prolonged disability, pain, immobility and repeated surgical procedures.[4]

Our study is mainly focus on better understanding of problems and results of bipolar hemiarthroplasty for femur neck fracture.

II. MATERIALS AND METHODS

This prospective observational study was conducted inSreemookambika institute of medical sciences, Kanyakumari during 2017-2018. Total 50 elderly patients above 60 years of age who were

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ambulatory, patients with transcervical neck femur fracture who have been operated with bipolar hemiarthroplasty in Tertiary Care Hospital. Non-ambulatory patients' pre injury, patients with associated fractures that may affect the final outcome and pathological fractures were excluded from the study.

After obtaining informed consent, patients were admitted to the ward, a detailed history was taken. In depth, clinical assessment was carried out in each case. In all patients preoperatively Buck's traction with appropriate weight was applied, to the fractured lower limb for relieving pain, preventing shortening and to avoid unnecessary movements of the injured limb and at fracture site. Oral or parental NSAIDs were given to relieve the pain. Preoperative AP radiographs of the affected hip joint of pelvis with both hips were taken for all the patients, keeping the fractured limb in 15 internal rotations to bring the neck parallel to X-ray film. Routine blood investigations, blood grouping and typing, urine routine, RBS, serum urea, creatinine, HbsAg, HIV, chest x-ray, ECG, were done in all cases. Necessary and adequate treatment was given for those associated with co-morbidity before taking them to surgery. Certain therapeutic exercises were taught preoperatively to the patients which had to be continued postoperatively, such as deep breathing exercises, static quadriceps exercises, ankle movements. Intravenous antibiotics and tetanus immunization were given an hour before the surgery. The limb was prepared from nipple to knee including perineum and back.

All patients were operated after being put into lateral decubitus position by the lateral approach or posterior approach of Moore. Patient undergoing hemiarthroplasty, the stem was cemented in place using 1st and 2nd generation cementing techniques.

Sitting cross-legged and squatting were not allowed. Suture removal was done on the fourteenth postoperative day. The patients were assessed for any shortening or deformities if any and discharged from the hospital. Patients who had infection and bedsores were treated accordingly before discharging them from the hospital.

Modified harris hip score was used for analysis of the functional outcome for all the patients. Which includes pain, limp, walking with support, distance walked, public transportation, use of stairs, put on shoes and socks, absence of deformity, range of motion. And graded as < 70: poor, 70 to 79: fair, 80 to 89: good, 90 to 100: Excellent. X ray – anteroposterior view with internal rotation of 15 – 20 degrees was taken for all the patients and analyzed for radiological parameters like joint space, any subluxation, acetabular changes, Stability of stem and stem subsidence based on which grading was done. Patients' pain was assessed by Vas scoring and graded as mild, mod, severe between 0 to 10. Finally all three parameters compiled and analyzed.

III. OBSERVATIONS AND RESULTS

A total of 50 patients were enrolled in the study of them 27 were males and 23 were females. The mean age of the patients was 68.58 years, ranged from 52 to 79 years. Table 1 shows the demographic details of enrolled patients. The most common mode of injury noted in the patients was fall leading to injury (40), while 3 patients suffered injury due to road traffic accident.

Table 1: Demographic profile of enrolled patients

Demographic Data		No. of Patients (%)
Age group (years)	51 to 60	04 (8%)
	61 to 70	31(62%)
	71 to 80	15 (30%)
	Mean age	68.58±5.77
Sex	Male	27 (54%)
	Female	23 (46%)

Out of 50 patients, 17 did not have any co-morbidity. Most common co-morbidity reported were diabetes mellitus and hypertension.

According to the Garden classification of hip fractures, majority of the patients had grade III hip fractures (62%) and most of these (72%) had right sided hip fractures. The most of the patients were managed using cemented prosthesis (74%) and in 44% of the cases 45 mm prostheses were used.

The mean duration of surgery was 107.9±11.61 minutes, ranged from 90 to 130 minutes. The mean blood loss was 368.8±47.46 ml with ranged 280 to 460 ml. Majority of the patients had weight bearing on the 2nd day post-surgery (24/50). 22 of the patients did weight bearing on day 1 while the remaining 4 patients did weight

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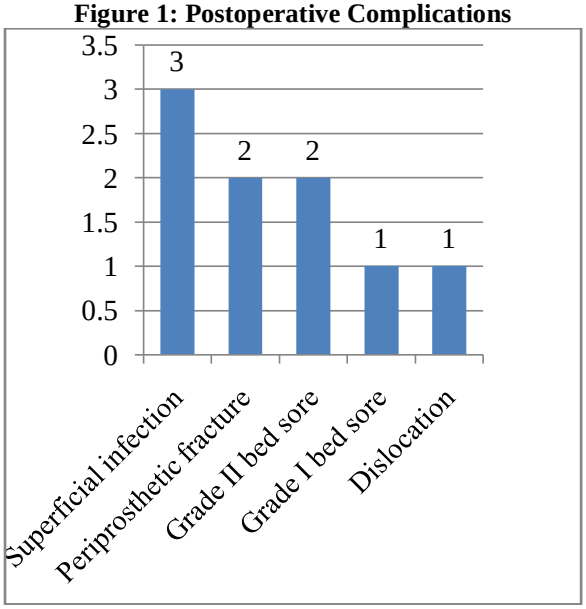
bearing on day 3. A total of 9 patients reported postoperative complications as shown in figure 2.

Figure 1: Postoperative Complications



On immediate post-operative assessment, 45 of the 50 patients had fair outcome. At 6 and 12 weeks of post-operative assessment, 36 and 39 patients respectively had good outcome by Harris Hip Score. At 6-month follow up, 30 patients had good outcome while 11 patients had excellent outcome. One patient was died at 6-month follow-up, (Table 3).

Table 2: Functional Outcome by Harris Hip Score

Time of Assessment	Outcome	Number of patients
Immediate Post-op	Fair	45
	Good	05
6 weeks	Fair	09
	Good	41
12 weeks	Fair	06
	Good	44
6 months	Death	02
	Fair	02
	Good	33
	Excellent	13

There was significant decrease in the VAS score till 6-month follow up, (Figure 2), as assessed by repeated measures ANOVA test ($p<0.05$). 45 of the 50 patients had a stable stem fixation while 5 patients showed signs of unstable fixation.

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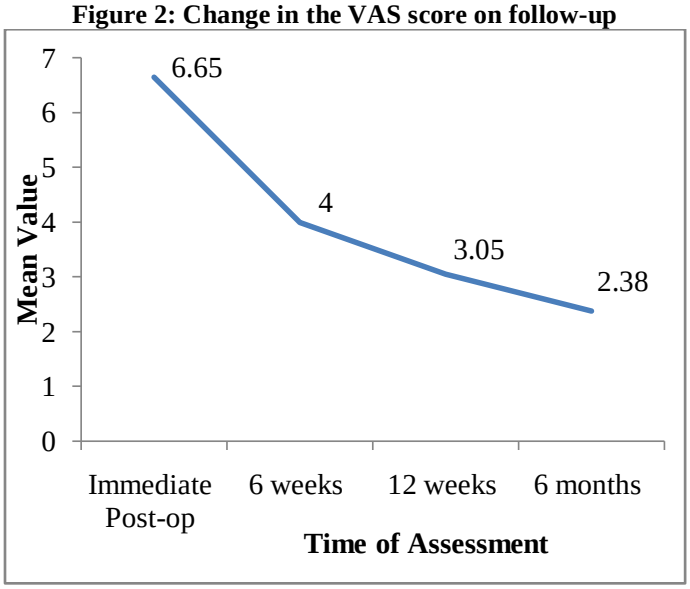
Figure 2: Change in the VAS score on follow-up



IV. DISCUSSION

The aim of replacement surgery in fracture neck femur is early return to daily activities. This is particularly applicable to the elderly age group where complications need to be prevented. The mean age of patients in the present study was 68.58 years which is comparable with the study conducted by Bashir et al[5] and Chhabra et al[6]. The aim of assessing age is to estimate the patient's mean survival time and their ability to comply with rehabilitation protocol. Patients with hip fractures have an increased mortality rate during the first year after fracture but after one year the mortality rate is comparable to that of the general population. The results of present study showed that age of the patient had minimal influence on the final clinical result. Males were affected in higher numbers which is comparable with the study done by Sakthivelet al[3]. Right side more commonly affected than the left, this is similar to other study conducted by Chhabra et al.[6] Majority of patients sustained the injury due to a trivial trauma like tripping or slipping. This is a very common occurrence in elderly population where poor vision and lack of neuro-muscular coordination is a problem. All of our patients had a displaced fracture of the neck of femur. Majority of the patients (80%) had a transcervical fracture. The anatomical type of fracture and the displacement did not have any bearing on the final function. These findings are in accordance with the study done by Adapureddiet al.[7]

The average duration of hospital stay amongst the study patients was 22 days which was similar to the previous studies.[8, 9] Out of 50 patients, 9 patients reported complications. Out of these, 3 of the patients reported superficial infection, while 2 patients each reported periprosthetic fracture, 2 grade II bed sore and 1 with dislocation. There were no other late postoperative complications like loosening, erosion, secondary osteoarthritis or protrusioacetabuli in our study. Similar complication rates were reported by other studies.[6,10]

On immediate post-operative assessment, 45 of the 50 patients had fair outcome. At 6 and 12 weeks of post-operative assessment, 36 and 39 patients respectively had good outcome by Harris Hip Score. At 6-month follow up, 30 patients had good outcome while 11 patients had excellent outcome. Two patient was died at 6-month follow-up. These results are correlated with the earlier studies [6, 11, 12]. Although the excellent results are comparatively less than other studies, it was found that our patients associated with comorbids, late presentation to hospital, delay in getting the patients for surgery had influenced the outcome.
The level of satisfaction being a subjective assessment did not correlate well with the Harris Hip Score which was an objective assessment. The present study was not without its shortcomings.

V. CONCLUSION

Our study patients has good radiological outcome with significant interprosthetic movements and bipolar seems to be a cost effective prosthesis in active elderly individuals. Similar study on long term follow up would provide more affirmative findings.

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