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Assessment of the functional outcome of cemented hemiarthroplasty in comminuted intertrochanteric fracture femur in geriatric patients

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Abstract

Background: Intertrochanteric fractures of the femur are one of the most common fractures in geriatric population. The present study was conducted to assess the functional outcome of cemented hemiarthroplasty in comminuted intertrochanteric fracture femur in geriatric patients.

Materials & Methods: This prospective study was done in the department of Orthopaedics in J.A. Group of Hospitals, Gwalior (M.P.). After preoperative assessment cases were prepared for surgery under all aseptic precautions and prophylactic antibiotic coverage. Variables like preoperative and post-operative clinical, radiological, surgical and functional status, Harris Hip score questionnaire, preoperative workup, surgical methods and postoperative follow up were recorded.

Results: The most commonly occurs in age group of 71-80 years. Out of 30 patients, 10 were female and 20 were male showing male preponderance. Side was left in 9 and right in 21. Mode of injury was fall on ground (Trivial trauma) in 26 and road traffic accident in 4. Boyd and griffin type was III in 11 and type IV in 19. Duration from injury to surgery (days) <10 in 03, 10-20 days in 10, 21-30 in 04, 31-40 days in 05 and >40 days in 08. Size of prosthesis was 41 in 05, 43 in 05, 45 in 08, 47 in 05, 49 in 04 and 51 in 03. The difference was significant ($P<0.05$). Harris score 91-100 was seen in 16.6%, 81-90 in 36.6%, 71-80 in 40% and <70 in 6.6%. Out of 30 patients, 04 developed superficial infection, 01 developed deep infection, 03 had cognitive dysfunction and 04 developed abductor weakness, 02 had wire loosening which was used for greater trochanter reattachment, no patient had posterior dislocation and wound dehiscence in follow ups.

Conclusion: The geriatric mobilization and weight bearing possible with this procedure leading to the minimization of complications related to prolonged immobilization in geriatric age group patients.

Keywords: Femur, geriatric mobilization, harris score

Introduction

Intertrochanteric fractures of the femur are one of the most common fractures in geriatric population [1]. Due to an increasing life expectancy as well as higher incidence of concurrent osteoporosis in geriatric age group, the incidence of these fractures is on the rise [2]. Earlier these fractures were managed conservatively by traction or external splinting which resulted in higher morbidity and complications [3]. So trends for operative intervention were increasing with time. Stable intertrochanteric fractures can be easily treated by osteosynthesis with predictable good result, whereas the management of unstable intertrochanteric fractures are challenging because of poor bone quality, osteoporosis and other underlying diseases [4].

In past “fixed angle devices” were used for the fixation of these fractures, but complication like implant cut out and fracture displacement were seen [5]. Subsequently, sliding hip screw was used with much success and became predominant method of fixation of these fractures. Intramedullary inter locking devices have shown reduced tendency for cut out in osteoporotic bone and also has better results in cases of unstable intertrochanteric femur fractures [6]. But complications such as head perforation, excessive sliding with subsequent shortening, plate pull out and plate breakage continued to be the problem specially with the unstable type of fractures. Osteoporosis and fracture instability are the most important factors leading to unsatisfactory results [7, 8].

The present study was conducted to assess the functional outcome of cemented hemiarthroplasty in comminuted intertrochanteric fracture femur in geriatric patients.

Materials and Methods

This prospective study was done in the department of Orthopaedics in J.A. Group of Hospitals, Gwalior (M.P.). The cases being selected on random basis those who have comminuted intertrochanteric fracture femur in geriatric age group (>70 years). Cases were operated as per admission and availability of operation theatre. After preoperative assessment cases were prepared for surgery under all aseptic precautions and prophylactic antibiotic coverage. Data collection procedure were included detailed study of variables like preoperative and post-operative clinical, radiological, surgical and functional status of involved extremity. Data collection tools were patient proforma, Harris Hip score questionnaire, preoperative workup, surgical methods and postoperative follow up. Harris hip score Questionnaire was used for functional outcomes. A thorough history were obtained including mechanism of injury and patients overall medical status, age, function and economical demands. The

functional outcomes and clinical results of the patients were evaluated. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table 1: Distribution of cases according to age

Age Groups (years)	No. of Cases	Percentage
71-80	21	70.00
81-90	09	30

Table 1 shows that in our study we observe that, these fracture most commonly occurs in age group of 71-80 years.

Table 2: Distribution according to gender

Sex	No. of Cases	Percentage
Male	20	66.66
Female	10	33.33

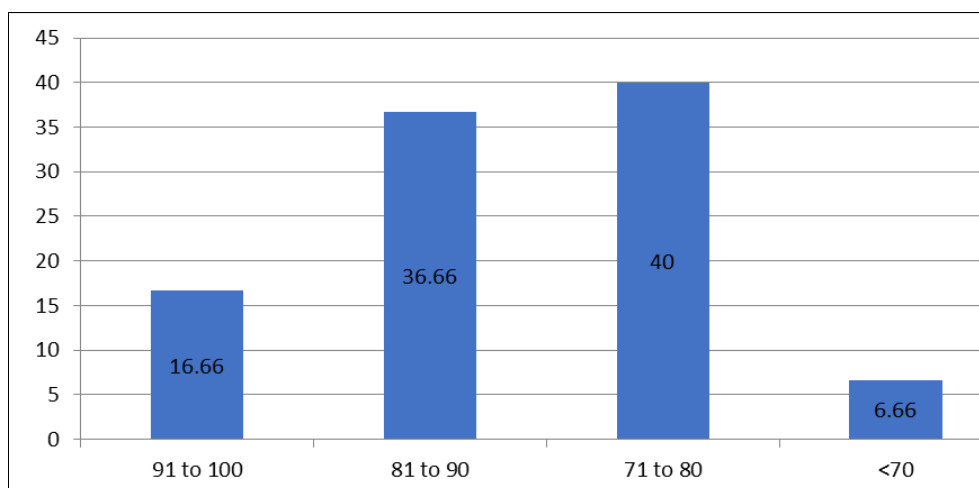
Table 2 shows that out of 30 patients, 10 were female and 20 were male showing male preponderance.

Table 3: Assessment of parameters

Parameters	Variables	Number	P value
Side	Left	9	0.01
	Right	21	
Mode of injury	Fall on ground (Trivial trauma)	26	
	Road traffic accident	4	
Boyd and griffin Type	TYPE III	11	
	Type IV	19	
Duration from injury to surgery (days)	<10	03	
	10-20	10	
	21-30	04	
	31-40	05	
	>40	08	
Size of prosthesis	41	05	
	43	05	
	45	08	
	47	05	
	49	04	
	51	03	

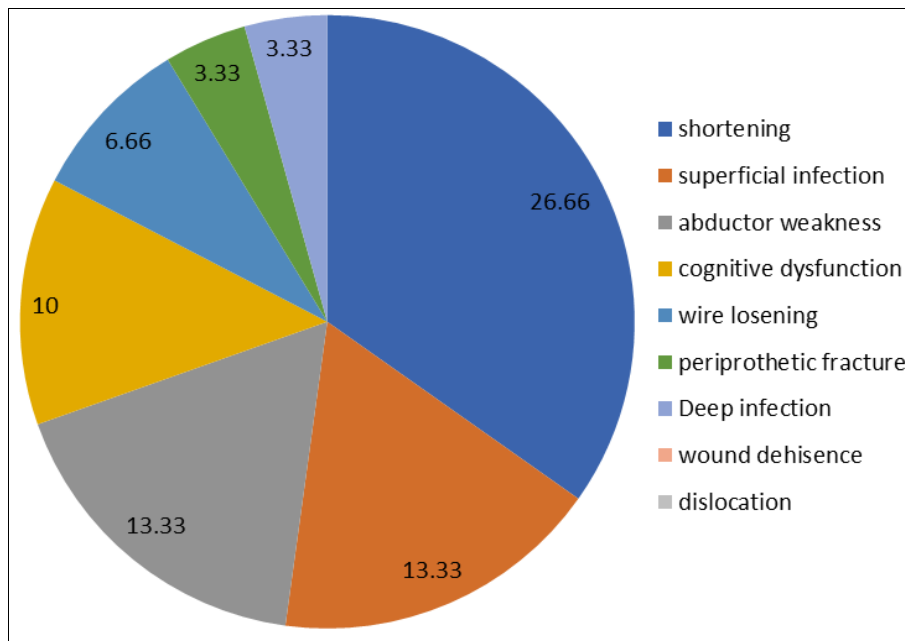
Table 1 shows that side was left in 9 and right in 21. Mode of injury was fall on ground (Trivial trauma) in 26 and road traffic accident in 4. Boyd and griffin type was III in 11 and type IV in 19. Duration from injury to surgery (days) <10 in

03, 10-20 days in 10, 21-30 in 04, 31-40 days in 05 and >40 days in 08. Size of prosthesis was 41 in 05, 43 in 05, 45 in 08, 47 in 05, 49 in 04 and 51 in 03. The difference was significant (P<0.05).



Graph 1: Harris hip score

Graph 1 shows that Harris score 91-100 was seen in 16.6%, 81-90 in 36.6%, 71-80 in 40% and <70 in 6.6%.



Graph 2: Complications

Graph 2 shows that out of 30 patients, 04 developed superficial infection, 01 developed deep infection, 03 had cognitive dysfunction and 04 developed abductor weakness, 02 had wire loosening which was used for greater trochanter reattachment, no patient had posterior dislocation and wound dehiscence in follow ups.

Discussion

Osteosynthesis with various implant (DHS/PFN) has been the treatment of choice for intertrochanteric fracture [9, 10]. However, the scenario is different when comes to the management of unstable fracture especially in geriatric population. Failure rate is as high as 56% have been reported with internal fixation of unstable fractures in geriatric population [11]. Early weight bearing following internal fixation of comminuted trochanteric fractures in elderly and osteoporotic patients leads to fixation failure and poor results which requires further surgical intervention and revision of surgery [12]. Initially hemiarthroplasty was used only in the treatment of failed fixation of intertrochanteric fractures, but now hemiarthroplasty is a frequently employed as an alternative for stability and allows early mobilization with full weight bearing [11]. Most of the complications associated with internal fixation can be avoided with the use of prosthetic replacement. In our study, we used bipolar prosthesis in all 30 cases with similar results. The mean age in studies by Hantjens *et al.* [12] was 80 years. In our study, mean age of patient were 76 years with fracture occurring most commonly in age group of 70 to 80 years with almost similar age distribution.

In our study, 26 patients sustained injury due to trivial trauma and 4 patient due Road traffic accident. Rodop O *et al.* [13] in their study of 44 patients, reported that 32 cases sustained injury due to trivial fall and rest 12 due to some other causes. In our study, out of 30 patient 11 had Boyd and griffin type III fracture and 19 had Boyd and Griffin type IV fracture pattern. Grimsrud *et al.* reported that most of cases were Boyd & Griffin type IV type.

In our study out of 30 patients, 03 patients were operated within 10 days since injury, 10 patients were operated within

10-20 days since injury, 04 patients were operated within 20-30 days since injury, 05 patients were operated within 30-40 days since injury and 08 patients operated more than 40 days. Surgery was delayed due to co-morbid medical conditions.

Out of 30 patients, 08 patients were operated using prosthesis of 45 mm head size, and 05 patients operated using prosthesis of 41 mm, 05 patients operated using prosthesis of 43 mm, 05 patients operated using prosthesis of 47 mm head size, 04 patients were operated using 49 mm head size and rest 03 patients using head size of 51 mm. In our study, average blood loss was 362 ml with only 13 patients required blood transfusion and the operative time was approximately. Florian Geiger *et al.* [14], reported a significant increase in blood loss (1050 ml) and operating time (115 minutes) compared to the internal fixation group.

In our study, we have not seen complications like pressure sores, pneumonia, Deep vein thrombosis, because most of our patients were made ambulatory early after surgery with active physiotherapy support. Grimsrud *et al.* [15], in a study of 39 patients of unstable intertrochanteric fractures treated with cemented bipolar hip arthroplasty, reported a relatively low rate of complication.

In our study, there were 8 cases, who had limb length discrepancy (shortening < 2 cm), which did not cause any discomforts to the patients. Siwach *et al.* [16], reported shortening of 5 mm in 64% of cases, 28% of cases had limb lengthening between 5 mm and 10 mm. He noticed shortening was due to excessive sinking of prosthesis following weight bearing.

In our study, 04 patients had developed abductor weakness which later improved with active physiotherapy. Sanchetti *et al.* [17], reported 6 patients with abductor weakness, in a study of 37 trochanteric fractures treated with bipolar hemiarthroplasty.

Conclusion

The incidence of comminuted intertrochanteric femur fracture is more in males as compared to female, which is against the general "consensus" as female is more affected due to post menopausal osteoporosis that may be due to small sample

size. The geriatric mobilization and weight bearing possible with this procedure leading to the minimization of complications related to prolonged immobilization in geriatric age group patients.

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