



Comparision of the Functional Outcome of Elderly Patients with Displaced Intracapsular Fracture Neck of Femur Managed With Cemented Hemiarthroplasty and Cemented Total Hip Replacement

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Abstract

Introduction

This study was performed to compare functional outcome of Bipolar Hemiarthroplasty (BA) and Total Hip Arthroplasty (THR) used in treatment of displaced intracapsular neck of femur fracture in elderly patients.

Method and Material

This prospective study included 30 patients above 60 years of age and having displaced neck of femur fracture, out of which 14 patients were managed by BA and remaining 16 patients were managed by THR, between May 2016 to 2017. These patients were regularly followed at 2 weeks, 1 month , 3 months and 6 months interval for functional analysis using HARRIS HIP SCORE .

Results

The Harris Hip Score was significant in THR group as compared to BA group at 2 weeks, 1, 3 and 6 months post operatively. Barthel index of activities of daily living, walking unaided (weeks) was higher in THR as compared to HA group. Pain was almost similar in both groups at the all follow up periods.

Conclusion

This study shows that functional results following THR are better as compared to BA. Also despite the fact that operative time and peri operative blood loss was higher in THR, there was no significant morbidity associated with the procedure when compared with HA.

Introduction

Fracture neck of femur is one of the most common injuries causing morbidity and mortality in the elderly⁽¹⁾. Trivial fall is the cause of these fractures in about 90% of cases .It is estimated that 1.6 million neck of femur occur every year worldwide and this number is expected to increase upto 6.3 million by 2050 ³. These fractures can cause significant changes in people's life and many patients never return to the same activity level. Fracture neck of femur has always been a great challenge to the orthopaedic surgeon and still remains the unsolved mystery as far as the treatment and its results are concerned⁴.

Arthroplasty for a displaced intracapsular fracture in elderly patient has been recommended because its avoids the risks of non union or avascular necrosis associated with internal fixation. Because of large percentage of failures of internal fixation, Hemiarthroplasty(HA) and

Total hip replacement (THR) have emerged as viable options with lesser morbidity and early mobilization. Both THR and BHR have their own advantages and disadvantages. Previous few documented studies, supported THR for better functional outcome than HA. However there are some advantage of HA over THR such lesser surgical time, less blood loss, less technically demanding, lower dislocation rates and lower costs⁵. There is no consensus on which treatment has better results for displaced intracapsular fracture neck of femur in elderly patients.

This study investigates the functional outcome of elderly patients with displaced intracapsular fracture neck of femur managed with cemented hemiarthroplasty and cemented total hip replacement. This will help in decision making regarding choice of procedure for these fractures in the elderly.

The parameters used to make this analysis in this study included functional outcomes, rate of complications and quality of life after these two surgical options.

Methods and Material

This prospective study was carried out in the Department of Orthopaedics of a tertiary care center between MAY 2016 to 2017. Prior to the study institutional ethical clearance was obtained. The study was carried out in 30 patients who underwent treatment at the same institute. A single blinded randomized clinical study were conducted. Patients were randomized to two groups Group I (14 patients) were treated with cemented hemiarthroplasty and in group II (16 patients) treated with cemented total hip replacement. We collected records of the patients by taking the patients' history and examining them. All the patients were carrying out activities of daily living on their own prior to trauma.

• Inclusion criteria

1. Patients with displaced fracture neck femur

2. Age- above 50 yrs

3. Patients who are fit for surgery

4. Patients consenting for the surgery.

• Exclusion criteria

1 Active ongoing infectious disease anywhere in body

2. Muscular disorders

3. Non consenting patients

4. Previously operated patients with implant in situ

5. Inability to ambulate 10 feet independently before injury

6. Pathologic fractures (malignancy)

Preoperative Preparation

Antero-posterior radiographs of the affected hip joint of pelvis with both hips were taken for all the patients, keeping the fractured limb in 15 degrees of internal rotation to bring the neck parallel to the radiograph film. In all patients, pre-operatively skin traction is applied to the affected limb, to reduce pain and to prevent unnecessary movement. Patients as well as the next-of-kin were explained about the surgery and risk factors and expenses, and written informed consent for the surgery was obtained from all patients. Both the surgical procedures were done using standard Moore's (southern) posterior approach. In the most of patients surgery is performed within 2- 3 days after surgical fitness given by anaesthetist and surgery is performed under spinal anaesthesia or combined spinal – epidural anaesthesia.

Post-surgical rehabilitation was similar for both groups and consisted of a joint-care programme rehabilitation protocol. Full weight-bearing and active exercises were commenced within first three days after surgery as tolerated. Patients were discharged after suture removal (14 days). These patients were followed up for a period of two years postoperatively at 2 weeks, 1, 3 and 6 months respectively, for functional analysis by HARIS HIP SCORE.

Statistical analysis, Q ualitative data was presented as frequency and percentage and analysis using Chi square test or Fischer 's exact test (in case 2x 2 contingency tables) . Quantitative data was presented as mean and SD and compared by unpaired t –test or Man – whitney U test (in case of non normal distribution) .The level of significance was set at $p = 0.05$. We utilised SPSS 20.0 for windows for all examinations.

Results

There were 30 patients in our study, out of which 14 patients (6 males and 8 females) underwent for Bipolar Hemiarthroplasty and 16 patients (6 males and 10 females) under went for total Hemiarthroplasty. All patients are above 60 years of age . The mean age in patients with hemiarthroplasty and total hemiarthroplasty was 68.5 ± 2.95 and 69.37 ± 2.27 respectively .

Patients associated with comorbidities are diabetes 7 (23.3%), hypertension 5(16.6%) , both (diabetes and hypertension) 14 (46.7%) and 4 (30%) have no commorbidities.

In our study the mean duration of surgery in hemiarthroplasty and total hemiarthroplasty was 55 ± 3.84 and 81 ± 4.8 . In our study the mean total blood loss in HA and THR was 152.14 ± 14 ml and 275 ± 20 ml respectively. Thus blood loss was significantly higher in THR as compared to HA .In the present study ,there was significantly higher number of patients in THR receiving blood transfusion while admitted 12 (1 unit) (70.59%) as compared to hemiarthroplasty 5 (1 unit) (29.41%) . Thus BA treatment was found better as compare to THA in relation of duration of surgery , mean blood loss and requirement of blood transfusion.

The Harris hip scores at 2 weeks of HA and THA was 36.21 ± 3.8 and 42.6 ± 3.1 respectively. The harris hip score at 1 month, 3 months and 6 months OF HA are 56.14 ± 3.6 , 77.43 ± 1.6 , 85.36 ± 41 respectively and

THA are 63.14 ± 1.8 , 85 ± 1.8 and 93.38 ± 1.7 respectively . Thus HARRIS HIP SCORE at 2 weeks , 1 month , 3 month and 6 months was significantly higher in THR as compared to HA group. (table 1)

Table 1 Harris hip score

	Group	Total HIP replacement	P value
	Hemiarthroplasty		
Harris hip score 2 wks	36.21 ± 3.8	42.69 ± 3.1	0.0001
Harris hip score 1 month	56.14 ± 3.6	63.14 ± 1.8	0.0001
Harris hip score 3 month	77.43 ± 1.6	85.56 ± 1.8	0.0001
Harris hip score 6 month	85.36 ± 4.1	93.38 ± 1.7	0.0001

The Barthel index of activities of daily living (at end of 6 month) of HA and THA 57.64 ± 11 and 61.88 ± 8.8 respectively. Total duration of hospital stay , Barthel index was higher in THR as compared to hemiarthroplasty group though statistically not significant ($p > 0.05$).

There was higher number of partially dependent patients on barthel index of activities of daily living 15(50 %) followed by need minimal help with activities of daily living 14 (46.7%). There was no statistically significant difference between barthel index of activities of daily living and among study population ($p > 0.05$). Barthel index of activities of daily living , walking unaided (weeks) was higher in total hip replacement as compared to hemiarthroplasty group though statistically not significant ($p > 0.05$) (table 2). The mild pain after 6 month was seen 5(35.7%) out of 14 patients treated

by BA and 3 (18.8%) out of 16 patients treated by THR . There was no statistically significant difference between pain (at 6 months) and amongst study population (p value >0.05) (table 3). There was no intraoperative complication observed amongst study population . Swelling of operated limb and UTI was present in 14.29% and 7.14% in hemiarthroplasty group while in THR , Swelling of operated limb was present in 6.25% and UTI IN 12.5%. Late postoperative complication in HA group was DVT (7.1%) and limb discrepancy (upto 2 cm) (7.1%) while in THR 18.5 % was observed (pvalue >0.05) .

Table 2 -Barthel index(Activities of daily living).

			Group		Total
			Hemiarthroplasty	Total HIP Replacement	
Barthel Index of Activities of daily living	Independent	count	0(0.0%)	1(6.3%)	1(3.3%)
	Needs minimal help with ADL	count	6(42.9%)	8(50.0%)	14(46.7%)
	Partially dependent	count	8(57.1%)	7(43.8%)	15(50.0%)
Total		count	14(100.0%)	16(100.0%)	30(100.0%)

Table 3 Pain (at 6 months) among study population during follow up

Pain(at 6 months)		Group		Total
		hemiarthr oplasty	Total HIP replacement	
No	count	9(64.3%)	13(81.3%)	22(73.3%)
mild	count	5(35.7%)	3(18.8%)	8(26.6%)
Total	count	14(100.0%)	16(100.0%)	30(100.0%)

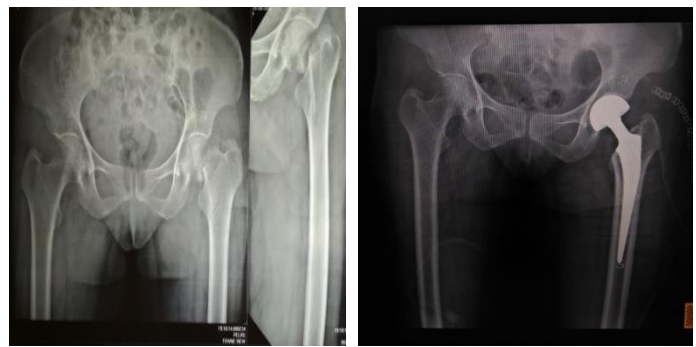


Fig (1) 62 years male case of left neck of femur fracture treated with Bipolar Hemiarthroplasty.



Fig (2) 70 years old female treated with total Hip replacement.

Discussion

The goal of treatment of these fractures is restoration of pre fracture function without associated morbidity.

In the present study , duration of surgery , intraoperative , post operative and total blood loss was significantly higher in THR as compared to HA . In our study the mean total blood loss in HA and THR was 152.14 +/- 14 ml and 275 +/- 20 ml respectively. Bloomfedt⁶ et al in their study showed that the mean blood loss in THR WAS 460 ml (100ml to 1100 ml) and HA group 320(50 to 850 ml) .

In the present study, there was significantly higher number of patients in THR receiving blood transfusion while admitted 12 (1 unit) (70.59%) as compared to

hemiarthroplasty 5 (1 unit) (29.41%) . similarly in the study conducted by Tuteja sanesh⁷ et al the mean volume of blood transfused in THA . (516.66 + 210.55) was more than hemiarthroplasty. We believe that in patients with no chronic underlying condition with adequate levels of haemoglobin would be more suited for thr as compared to patients with lower levels of the same pre operatively. We therefore believe that this might be a contraindication for there in the elderly with poor nutritional status and lesser blood reserves following chronic ailments.

In the present study , there was no intraoperative complication observed amongst study population . Immediate post operative complication included swelling of operated limb and UTI in 14.29 % and 7.14% in hemiarthroplasty group while in total hip replacement , swelling of operated limb was present in 6.25% and UTI 12.5% . Similarly in the study conducted by tuteja sanesh et⁷ al 2014 post operative complication like UTI was present in 4.16% and 4.76 % of hemiarthroplasty group and total hip replacement respectively .

In the present study , late postoperative complication in hemiarthroplasty group was DVT (7.1%) and shortening of limb (7.1%) while in total hip replacement , shortening of limb and lengthening of limb was observed in 12.5% and 6.25% respectively . There was higher occurrence of complication in patients with THR (18.7%) as compared to hemiarthroplasty group (14.2%). Similarly in the study conducted by tuteja sanesh et⁷at complication such as bed sore , UTI , Thrombophelitis , Foot drop , and DVT was higher in the hmiarthroplastygroup (37.5%) as compared to THR . Similarly in the study conducted by Hopley et⁸al the general complications to be slightly more often following THR than after hemiarthroplasty. the differences in complication were not found to be statistically different in the two groups. Even though thr maybe be perceived as a longer procedure , we believe

that the complication rates remain the same as compared to bipolar hemiarthroplasty.

In the present study , hemiarthroplasty group 35.7% had mild pain (at 6 months) while in THR , mild pain (6 months) was present in 18.8% . Skinner P et al⁹ reported pain mild to no pain to mild pain was reported in 75% after THR and in 56% after HA . therefore patients can be counselled that post operative pain does not get affected across the two procedures .

In the present study , hemiarthroplasty group , 92.86% of study of population were able to do daily activities while in THR 100% of study population was able to do daily activities . In the present study , harris hip score at 2weeks , 1 month , 3 month and 6 months was significantly higher in total hip replacement as compared to hemiarthroplasty group. These finding correleate well with study conducted by blomfeldt et at ⁶in which hip harris score was significantly higher in THR as compared to hemiarthroplasty group at the end of follow up.

Total duration of hospital stay , barthel index of activities of daily living , walks unaided (weeks)was higher in THR as compared to hemiarthroplasty group though statistically not significant.

Conclusion

The present study clearly indicates that functional results following Total Hemiarthroplasty are better as compared to bipolar hemiarthroplasty . Also despite the fact that operative time and peri operative blood loss was higher in THR, there was no significant morbidity associated with the procedure when compared with HA . the perioperative complications of the two procedures were also comparable. We believe that unless there is a contra indication due to the fitness of the patient , THR would give better results as compared to HA.

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