

Evaluation of results in intracapsular fracture neck of femur with Austin Moore's prosthesis

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Abstract

Introduction: Fracture neck of femur remains an unsolved fracture to the orthopaedic surgeon as far as treatment and results are concerned. Present study is designed to assess the results of primary hemireplacement arthroplasty of hip for displaced femoral neck fracture in the elderly patients by Austin Moore prosthesis. To reduce the hospital stay and provide better functional results like early easy mobilization and weight bearing and to reduce the incidence of Fracture Disease. To assess the complications of primary hemireplacement arthroplasty by Austin Moore prosthesis.

Materials and Methods: In this study, primary hemireplacement arthroplasty of the hip was done in 30 patients with fracture neck of femur using Austin Moore prosthesis who were admitted in the Department of Orthopaedics in Konaseema institute of medical science amalapuram, from August 2014 to August 2016. Intra capsular fracture neck of femur in patients of age 60 years and above, Non-united fracture neck of femur, all types of fracture under Gardens classification are considered.

Result: In 43% (13) patients fracture was in right side and 57% (17) patients fracture was in left side. Garden type-4 fracture was present in 14(46.7%) patients, Garden type-3 fracture was present in 12(40%) patients. 13.3% (4) patients were having Garden type 2 fracture. Average blood loss during the procedure was less than 500ml in 20pts, between 500-700ml in eight patients, and more than 750ml in 2 patients. The final Harris hip score was excellent in 46.7% of the patients, good in 8(26.7%) patients, fair in 6(20%) patients and poor in 2 (6%) patients.

Discussion and Conclusion: We conclude that hemiarthroplasty for fracture neck of femur is a good option in elderly patients. The mortality and morbidity are not high, operative procedure is simple, complications are less disabling. Early functional results are satisfactory.

Keywords: Intracapsular fracture of neck of femur, Austin Moore prosthesis, Primary hemi-replacement arthroplasty.

Introduction

Fracture neck of femur remains an unsolved fracture to the orthopaedic surgeon as far as treatment and results are concerned. There is still a dilemma over internal fixation or arthroplasty in the treatment of fracture neck of femur in the elderly¹ age group. Controversy should rest at a surgical procedure which brings about earliest pre-fall status to these elderly and infirm patients with least complications.²

The first efforts on treating hip fractures concentrated on alignment of fracture fragments by traction and closed reduction. The reduction was maintained by long term traction, spica cast or internal fixation. However, despite the most accurate anatomic alignment and most rigid fragment fixation, many patients failed to regain normal use of their hips. Nonunion of the femoral neck, avascular necrosis of the femoral head and the degree of the fracture comminution precluded good results in many. Non-anatomic reduction and inadequate fixation cause prolonged disability, pain, immobility and repeated surgical procedures.³

This study includes uncemented unipolar hip arthroplasty with Austin Moore prosthesis for fracture neck of femur. The follow up of these cases were done to assess the end results, especially as related to our Indian patients in and around Amalapuram East Godavari district of Andhra Pradesh. The problem of fracture neck of femur is one of the oldest in orthopaedics. In spite of numerous advances in osteosynthesis, the incidence of avascular necrosis and nonunion is very high. Fracture of the neck of the femur can

occur at all ages and in both sexes, but they are usually sustained by elderly persons following trivial trauma. At one point of time, this fracture was thought to be a terminal event in the life of old, feeble and fragile individuals. In spite of earnest work by many in this field the problem remains far from being solved, hence rightly labelled as "Unsolved Fracture" by Dickson.⁴

Present study is designed to assess the results of primary hemireplacement arthroplasty of hip for displaced femoral neck fracture in the elderly patients by Austin Moore prosthesis. To reduce the hospital, stay and provide better functional results like early, easy mobilization and weight bearing and to reduce the incidence of Fracture Disease. To assess the complications of primary hemireplacement arthroplasty by Austin Moore prosthesis.

Materials and Methods

In this study, primary hemireplacement arthroplasty of the hip was done in 30 patients with fracture neck of femur using Austin Moore prosthesis who were admitted in the department of Orthopaedics in Konaseema institute of medical science amalapuram, from August 2014 to December 2018.

Inclusion Criteria

Intra capsular fracture neck of femur in patients of age 60 years and above, Non-united fracture neck of femur, all types of fracture under Gardens classification are

considered. Age of injury in all cases was between 3 to 15 days.

Exclusion Criteria

Patients below 60 years, avascular necrosis of femoral head with acetabular changes, Pathological fractures of neck of femur, Patients medically unfit for surgery, Patients who lost for follow up.

Type of Study

Study will be a hospital based, prospective, non-randomized study and duration from august 2014 to august 2016. Patients who met the inclusion and exclusion criteria were selected from attending OPD and casualty department were admitted.

Pre-Operative Evaluation

As soon as these patients were admitted in the hospital, name, age, sex, occupation, history of present illness, personal history of the patient was recorded and detailed clinical examination was done.

General Examination

Detailed clinical examination was done regarding the built, nutrition, pallor, cyanosis, icterus, pedal edema, lymphadenopathy, physiological age, physiological status, intelligence, willingness to undergo surgery and post-operative cooperation of the patient. The temperature, pulse, blood pressure and respiratory rate were also noted.

A thorough examination of the hip was done, deformities, weakness, and limb length discrepancies if any were noted. A detailed systemic clinical examination of Cardiovascular System, Respiratory System, Central Nervous System, per abdomen and Genito-urinary system was done and if there was anything significant, it was noted and treatment was instituted.

Condition of the skin around the hip was noted. Height and weight of the patient was also noted.

A detailed clinical examination of the spine, knee and ankle was done to rule out any deformities or contractures. (A flexion contracture of the ipsilateral knee or equinus deformity of the foot may require correction before hemiarthroplasty of the hip).

True hip pain must be differentiated from sacroiliac pain, and lumbar pain, trochanteric bursitis, pubic ramus fracture or intra-abdominal problem by clinical examination.

Investigations

X-ray of the pelvis with both hips, anteroposterior view was taken with both the limbs in 15 of internal rotation.

Thickness of the cortex of the femur, width and shape of medullary canal, bone stock, type of fracture (GARDEN'S classification),⁶ amount of calcar present, level of femoral neck cut to be made, pre-operative size of the head (magnification deducted) and bone stock of acetabulum was noted.

Chest X-ray and ECG were done. A complete blood analysis including HB%, TC, DC, ESR, RBS, FBS, PPBS, blood urea, Creatinine, serology, blood grouping and typing, bleeding and clotting time were done. Urine analysis was done and urine culture done if required. Cardiac evaluation,

Liver function tests and renal function tests were done if required.

Pre-Operative Treatment

For fresh fractures skin traction with 3 - 4 kg weight was applied to relieve the pain and muscle spasm. The part was prepared 24 hours before surgery, taking care to prevent abrasions. Preoperative anesthetic assessment was done. The following training was given to the patients preoperatively so that the same could be carried out post-operatively like, o Deep breathing exercise. Static Quadriceps exercise Ankle and toe movements.

A written consent of the patient and relatives was taken. Injection Ceftriaxone 1 gm IV was administered intravenously 20 minutes prior to surgery.

Procedure

With a patient in spinal or epidural anaesthesia, patient in true lateral position, the affected hip upper most. The part was scrubbed with 7.5% Povidone iodine scrub (betadine scrub) and then painted with 5% povidine iodine solution (betadine solution), surgical spirit and then draped.

Posterior approach (Southern's) was used. Making a 10 to 15cm curved incision centering the posterior aspect of greater trochanter extending 6 to 8cm above and posterior to the posterior aspect of greater trochanter, curve the incision across the buttock and continue down along the shaft of the femur. Incise the fascia lata on lateral aspect of femur to uncover the vastus lateralis. Lengthen the fascial incision superiorly in line with skin incision bluntly split the maximus fibers.

The sciatic nerve was then identified and retracted. The short external rotators, viz; from below upward, the quadratus femoris, the obturator internus; gemelli and the piriformis were exposed. The Obturator internus and gemelli and if necessary the piriformis we divided close to their insertion, and reflected backwards. Thus, posterior part of capsule was well exposed.

A T shaped incision was made in the hip capsule, in line with the femoral neck and across its base. The capsule was retracted and labrum was preserved.

Then the thigh and knee were flexed up to 90°, adducted and, internally rotated thus dislocating the hip posteriorly. The femoral head was extracted using bone levers or corks screw. The remnant of ligamentum teres was excised and any loose pieces of bone (of the comminuted neck) in the acetabulum removed, the cartilage of the acetabulum inspected for any degenerative changes.

The femoral neck was cut using a oscillating motor saw or osteotome in such a way that enough of the calcar (minimum 0.5 inch) remained to, support the medial aspect of the prosthesis in all cases and cut was taken one finger breadth from lesser trochanter.

The size of the femoral head removed from the acetabulum was measured using a head gauge and trial or definitive prosthesis was checked for fit. The head size should be neither too loose nor too tight. Awl or straight curate was inserted in line with the femoral shaft to aid in

entering the diaphyseal medullary canal. An appropriate broach or rasp, medullary canal was enlarged in valgus and 10°- 15° of anteversion relative to the plane in which the knee joint axis lies. Appropriate size of the prosthesis was seated in the prepared medullary canal with 10-15° of anteversion and a valgus position. The prosthesis was impacted with gentle blows into the medullary canal, prosthesis was reduced gently into the acetabulum.

Muller noted that the center of the head of the prosthesis should be slightly superior to the level of the upper edge of the greater trochanter. If it is too high riding, some more neck should be osteotomised to enable easy reduction of prosthesis and prevent post-operative limb lengthening.

The hip was tested for full range of movements and stability intra operatively. Short external rotators were repaired with anchoring technique.

The wound was closed meticulously in layers over a suction drain in situ and sterile dressing was applied. Blood loss was assessed and blood transfusion carried out if required.

Result

After average 11 months follow up of elderly patients who had under gone hemi arthroplasty using Austin Moore prosthesis, following observations were made from collected data.

Table 1: Demography and clinical presentation of patient

Variables		Number	Percentage
Age	60-69	13	43%
	70-79	14	47%
	>80	03	10%
Sex	Male	14	47%
	Female	16	53%
Side of fracture	Right	13	43%
	Left	17	57%
Type of Graden classification	Graden type of 1	0	0
	Graden type of 2	4	13.3
	Graden type of 3	12	40
	Graden type of 4	14	46.7
Mode of injury	fall	22	73.4%
	Fall from moderate height	4	13.3%
	RTA	4	13.3%

As per table 1 regarding age of the patients, 13(43%) patient were between 60-69yrs of age, 14(47%) patients were between 70 to 79yrs of age and rest were above 80yrs of age. Out of 30 patients 14(47%) were male and 16 (53%) were female. In 43% (13) patients fracture was in right side and 57%(17) patients fracture was in left side. Garden type-

4 fracture was present in 14(46.7%) patients, Garden type -3 fracture was present in 12(40%) patients. 13.3% (4) patients were having Garden type 2 fracture.

Fall was mode of injury in 73.3%(22) patients, fall from moderate height was mode of injury in (13.3%) 4 patients 13.3% (4) patients mode of injury was road traffic accidents.

Table 2: Associated discord of the sample selected.

Associated disease	Frequency	Present
Nil	15	50%
HTN	6	20%
DM	5	16.7%
DM+HTN	3	10%
IHD	1	3.3%

Regarding associated disorders with the patients, 15(50%) were having no symptoms, 6 patients (20%) have hypertension. DM was present in 16.7% patient and 10% patients were presented with both (diabetes and hypertension). Ischemic heart disease was found in one patient.

Table 3: Size of prosthesis used

Head Size in mm.	Number	Percentage
39	2	6.7
41	4	13.3
43	6	20
45	7	23.5
47	10	35
55	1	3.5

Various size of prosthesis was used for patients. Prosthesis with head size 39mm was used in 2 (6.7%) patients, 41 mm head size prosthesis was used in 4 (13.3%) patient. In 6(20%) patients 43mm head size prosthesis was used, 45mm head size prosthesis was used in 7 (23.5%) patients. In 10 (35%) patients we have used 47 mm head size prosthesis. 55mm head size prosthesis was used in only one subject.

Table 4: Complications

Variables	Number of patients	Percentage
None	26	87%
Bed sore	2	6.5%
Sup. Infections	2	6.5%
Posterior dislocation	0	0
death	0	0

There was no complication in 87% patients, two patients developed superficial infection and two patients developed bed sore.

Table 5: Average blood loss during the procedure

Quantity	Number of patients	Percentage
<500ml.	20	66.6
500-750ml	8	26.7
>750ml.	2	6.7

Average blood loss during the procedure was less than 500ml in 20pts, between 500-700ml in eight patients, and more than 750ml in 2 patients.

Table 5: Ambulation after surgery

Variables	Number	Percentage
Patient who ambulated 3 days after surgery	21	70%
Patients who ambulated 5 days after surgery	9	30%

21 patients (70%) were ambulated after 3 days, but 9 (30%) patients were ambulated after 5 days of sensory.

Table 6: Final Harris Hip score and clinical right

Grade	Harris hip score	Number	P value
Excellent	90-100	14	46.7
Good	80-89	8	26.7
Fair	70-79	6	20
Poor	>70	2	6.0

The final Harris hip score was excellent in 46.7% of the patients, good in 8(26.7%) patients, fair in 6(20%) patients and poor in 2 (6%) patients.



Fig. 1

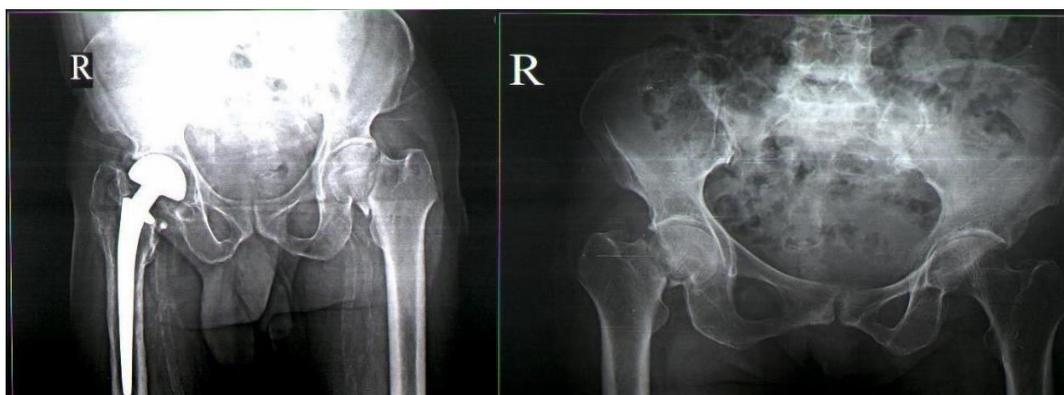


Fig. 2

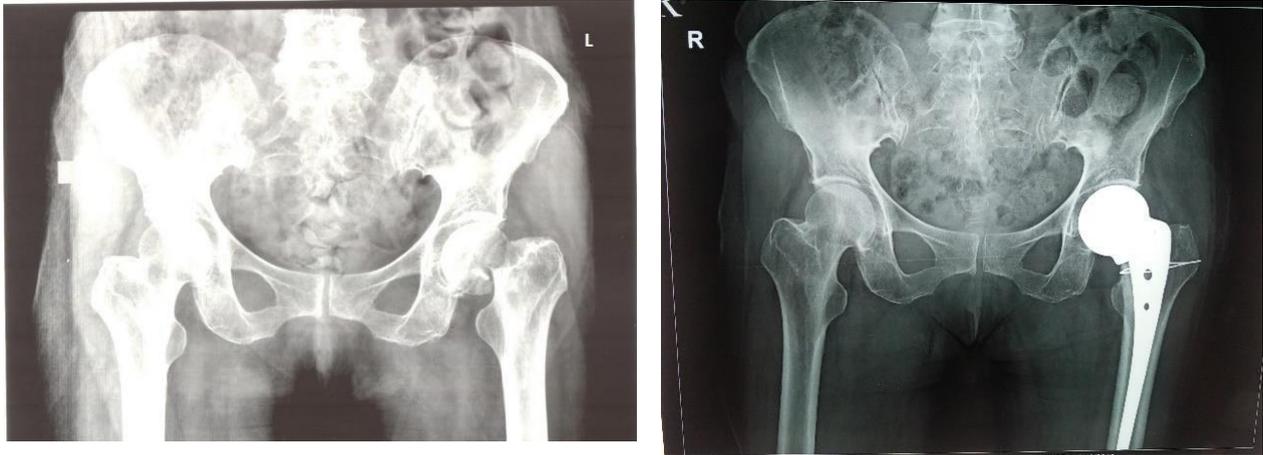


Fig. 3: Functional result after surgery



Fig. 4



Fig. 5: Functional result after surgery

Discussion

We have observed that mean age of the patient was 69.43yrs, which is supported by the work Saxena & Saraf, that is 66yrs, mean age of the patients by various author was as per table

Table 7

Author	Percentage
Saxena & Saraf et al ⁶	66 yrs
Mukarjee & Puri et al ⁷	65 yrs
Arwade et al ⁸	72 yrs
Bavadekar and Manelkar et al ⁹	75 yrs
Our studies	69.43 yrs

There was female predominance in our study which corroborates with the finding Choudary & Mohite et al,¹⁰ Moor et al,¹¹ Sikroski & Barrington et al¹² and D¹ Acry and Devas et al.¹³ In this study 53% presented with left side hip fracture, which was 55% in the study of Boyd and Salvatore et al,¹⁴ D¹ Acry et al¹³ has found it to be 55.4% which supports our study.

In our study most of the fracture were displaced and belong to Garden type III and Garden type IV. This finding corroborate with the study of G.S Kulkarni et al,¹⁵ and Mukherjee and Puri et al.¹⁶ In most of the cases (74%) trivial trauma was the nature of injury, this finding is supported by the work of Gyepes et al¹⁷ Evarts et al¹⁸ and Ingahalikar et al.¹⁹ The common associated problem was

diabetes, hypertension and IHD which is supported by the findings of Hinchey and Day et al.²⁰ Mean duration of stay in hospital was 14 days, but Stinchfield and cooperman et al²¹ reported 31.5 days and A.A savastano reported it to be 21 days, which does not corroborates with over finding. In present series there was no operative deaths but Wai Hee Lo et al²⁴ and scroll D et al²⁵ has respond 4% mortality due to sepsis. In our study two patient who were diabetic developed superficial wound infection. Salvatti et al²⁶ and Moore and Whittaker et al²⁷ have respond high mortality following infection of prosthesis.

In present series, there was no case of posterior dislocation of the prosthesis. Salvatti et al.²⁶ believed that excessive postoperative flexion or rotation with hip adducted is the main cause for dislocation of the prosthesis and they also observed that dislocation was commonly caused while shifting the patients from the operation theatre to the ward.

John E. Kenzora et al²⁸ noted that all six dislocations in their series followed posterior approach. Dislocation is a well-known complication of posterior approach. However, in present series number of dislocations are not great enough to reach statistical significance.

The results at average of 11 months after hemiarthroplasty in present series was analysed by modified Harris hip scoring system.70% patient were mobilised after 3 days and 30% were mobilised after 5 days. The results are compared with the available western and Indian series where hemiarthroplasty was done for the treatment of

fracture neck of femur in elderly patients. The differences between excellent and good results are minimal and therefore they can be grouped together as good results. Which is comparable to the work of Hinchey and Day et al that is 72.8%.²⁰

Conclusion

We conclude that hemiarthroplasty for fracture neck of femur is a good option in elderly patients. The mortality and morbidity are not high, operative procedure is simple, complications are less disabling. Early functional results are satisfactory. The complications are less disabling, weight bearing is early, early functional results are satisfactory and second operation is less frequently required. This study included 30 patients which may be a small number to give a statistically significant opinion. The cases were studied with a follow-up ranging from 3 weeks to 6 months only.

Our early and short term results are encouraging and promising, long term results will be studied in future and compared with other long term follow up studies.

Conflict of Interest: None.

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