Original Research Paper

Volume - 10 | Issue - 9 | September - 2020 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Orthopaedics

A PROSPECTIVE STUDY OF FUNCTIONAL END RESULTS OF HEMIREPLACEMENT ARTHROPLASTY WITH AUSTIN MOORE PROSTHESIS IN FRACTURE NECK OF FEMUR

Dr Atul Jain	(Associate Professor) Department Of Orthopedics, Rama Medical College Hospital & Research Centre, Pilkhuwa, Hapur UP
Dr Vimal Kumar Dakour *	(Assistant Professor) Department Of Orthopedics, Rama Medical College Hospital & Research Centre, Pilkhuwa, Hapur UP.*Corresponding Author
Dr Rajesh Bhatia	(Professor) Department Of Orthopedics, Rama Medical College Hospital & Research Centre, Pilkhuwa, Hapur UP.

ABSTRACT **Background:** In this clinical study Twenty cases of intracapsular fracture neck of femur in patients above the age of 65 years irrespective of sex treated by hemiarthroplasty using unipolar (Austin Moore's prosthesis, in the Department of Orthopaedics at Rama medical college hospital & research centre ,HAPUR,were followed up and functional results were analyzed following the procedure with the objectives to study the quality of life after hemiarthroplasty, morbidity associated with the procedure, recovery of physical, social and vocational independence, and associated complications.

Material & Methods : Twenty cases of fracture neck of femur in elderly patients above the age of 65years treated by hemiarthroplasty using Austin Moore Prosthesis.

The cases were followed up for 12 months and the short term functional results were analyzed by using modified Harris hip scoring system5.

Results: Most of our patients were in the age group of 65-79 years with mean average age of 77.38 for males and 74.33 for females. Majority of the fractures were subcapital radiologically. In 90 percent cases the mode of injury was trivial trauma. Among the associated medical conditions hypertension, diabetes mellitus and gross anaemia were common. Some of the complications observed were superficial infection of the wound, bedsore, prosthesis subsidence and posterior prosthetic dislocation. There were 36.84% excellent results and 42.10% good results

Conclusion: The success of hemiarthroplasty depends on preoperative planning and proper attention to surgical details to achieve the optimum biomechanical stability.The poor results (10.53%) were due to pain in the hip or thigh after hemiarthoroplasty. We conclude that hemiarthroplasty with Austin Moore Prosthesis for fracture neck of femur is a good option in elderly patients ,operative procedure being simple, complications are less disabling and early functional results are satisfactory.

KEYWORDS : Unipolar– Hemiarthroplasty – Femoral neck fracture

INTRODUCTION

Fracture neck of femur have always presented great challenges to the orthopaedic surgeons and remain in many ways today the unsolved fracture as far as the treatment and results are concerned. With life expectancy increasing with age due to improvement in medical and surgical facilities with less number of elderly people dying of disease of old age our society is becoming more of a geriatric society, with increased number of elder people sustaining fracture neck of femur. Hip fractures most commonly affect the elderly and impact on both the health care system and society in general. Even today to fractures consume a potential proportion of our health care resources.[1] Inspite of earnest work by many in this field the problem still remains far from being solved, hence rightly labeled as **"Unsolved Fracture"** by speed[2]

Fracture neck of femur has been recognized since the time of Hippocrates and is a common orthopaedic problem in elderly. In USA, the lifetime risk of a hip fracture is 16% - 18% in women and 5% - 6% in men. More common in females attributed to factors like post menopausal osteoporosis ,hormonal disturbances, wide pelvis with decreased neck shaft angle, longer life expectancy and less activity. Frangakis reported that femoral neck fractures are secondary to the senile osteoporosis that is seen in older women. By 65 years of age, 50% of women have bone mineral content below fracture threshold, and by 85 years of age, 100% of women have a bone mineral content below this threshold[3]. Since populations are aging worldwide, the mean age of the hip fracture patients are increasing rapidly, too. Reduced bone density by age has been the most frequently mentioned reason for the increase of fracture neck femur. In general, the incidence is high among the elderly,due to diminished vision, hearing, muscular incordination and weak bones due to osteoporosis. In spite of the above risk factors, elderly people among the rural population continue to work in the fields to earn there daily living.

The blood supply of the neck and head of the femur is extensive, intricate and complicated.[4] Healing process mainly depends on the good blood supply and is always in doubt. So one has to decide whether the prolonged immobilization has to be employed to achieve the bony union or quick ambulation by hemireplacement arthroplasty, to achieve fair degree of function.

Being a important weight bearing joint a successful operation at the hip joint should provide painless, stable hip with wide range of movements. There are various treatment options depending upon age, activity level, fracture pattern, etc. such as Moore's pins, Knowles pins, multiple cancellous screw fixation , dynamic hip screw fixation, Austin-Moore hemiarthroplasty, Thompson hemiarthroplasty, bipolar or unipolar modular hemiarthroplasty, and total hip replacement.

Among these treatment modalities osteosynthesis with internal fixation procedures rely in preserving the head of femur, but despite all operative skills, a perfect functional result from these procedures cannot always be secured and still there is a high incidence of non union and avascular necrosis leading to late osteoarthritis. These procedures are justifiable in young patients, but in Elderly patients, prolonged recumbency leads to many problems such as bed sores, cardiac and respiratory problem, thromboembolism, renal problems and dementia. This led many surgeons to abandon the osteosynthesis procedure for displaced femoral neck fracture in elderly patients, in favour of primary hemireplacement arthroplasty, which has certain advantages such as early ambulation, shortening the period ofhospitalization and also avoids danger of non union and avascular necrosis: Hemi replacement arthroplasty with Austin Moore prosthesis is a well established procedure since quarter of a century. Unipolar arthroplasty is used mainly as a salvage procedure in old fracture neck femur with non-union, for failed internal fixation and in elderly patients with fresh fracture neck femur in whom there is not much functional demand, particularly, people who lead a sedentary life. This procedure gives good stability, allows quick mobilization, pain free movements with low morbidity and mortality rates in suitable candidates.The goal of treatment is restoration of Prefracture function without associated morbidity6.

This clinical study presents the short term results of prospective randomized trial of hemiarthorplasty for the treatment of displaced femoral neck fractures in the elderly. Outcomes at 6 weeks, 3 months and 6 months and 12 months were analyzed by modified Harris hip scoring system.

SURGICAL TECHNIQUE

Surgical Procedure

All surgeries were performed on an elective basis using standard aseptic precaution under spinal or general anaesthesia.

Position of the patient:
Lateral position with the patient lying on the unaffected side. The skin over the hip was scrubbed with povidone-iodine. The lower extremity from the groin to the toes was drapped in sterile towels separately to enable easy manipulation of the limb during surgery.

Moore's Approach (Southern exposure)

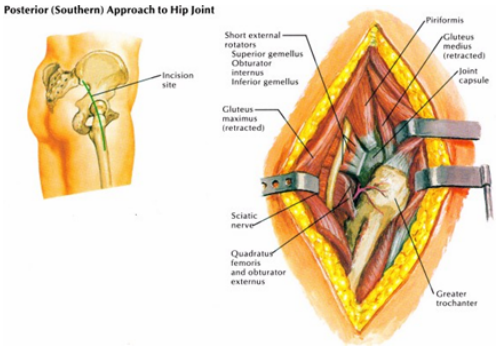

Fig 11; Moore's Approach

1) For all patients posterior approach (Moore's Approach also labeled as Southern exposure) was used in Present Series.
2) Skin incison starting from a point 10 cm distal to posterior superior iliac spine and extended distally and laterally parallel to the fibres of gluteus maximus to the posterior margin of the greater trochanter and then directed about 10 cm parallel to the femoral shaft.
3) Deep fascia was exposed and divided in the line with the skin incision as also was the fascia over gluteus maximus, which was then split in the direction of its fibres using blunt dissection.
4) By retracting the proximal fibres of the muscle proximally, the greater trochanter was exposed. Distal fibres are retracted distally and partly divided at their insertion into the linea aspera in line with the distal part of the incision.
5) The sciatic nerve was usually not exposed. It is protected with finger in the medial part of the wound and was gently retracted out of the way. The gemelli, obturator internus and the piriformis tendon were divided at their insertions after tagging them for easier identification and reattachment
6) The posterior part of the capsule thus exposed was incised from distal to proximal along the line of neck of femur and at right angle to it, thus making a T shaped opening in the capsule.
7) Then the 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 and size measured using femoral head guage. The size was confirmed using a trial prosthesis by its suction fit in the acetabulumTheacetabulum was prepared by excising remaining ligamenturn teres and soft tissue. The femoral shaft was rasped using a broach (rasp) and prepared for the insertion of the prosthesis. Femoral neck if long was nibbled keeping 2 to 2.5 cms of calcar above the lesser trochanter..
8) The prosthesis was then inserted into the femoral shaft in about 5-10 degrees of anteversion and impacted into the femur. The reduction of the prosthesis was then done using gentle traction of the thigh. . The head size should be neither too loose nor too tight. The hip was tested for full range of movements and stability intra operatively.
9) Absolute haemostasis was obtained.
10) After suturing the capsule, the external rotators were sutured, the wound was closed in layers over a sanction drain, which was removed at the first change of dressing after 48 hours.

Postoperative Management
A pillow was kept in between both the legs so that the leg was in abduction. Foot end of the bed was elevated and regular half hourly T.P.R. and blood pressure charts were maintained for initial 24 hours.

Antibiotics in the form of parentral cefotriaxone 1gm, once a day was given for the first two days and later shifted to oral antibiotics. Intramuscular analgesics were given as per patients compliance. Deep breathing exercise were advised

Drain removal was done after 48-72 hours depending upon collection. A Post operative check X-ray was taken and the valgus seating with 10°-15° of anteversionwas confirmed. Any limb length discrepancy was noted. Knee flexion, isotonic quadriceps exercises and Hip abduction, flexion and extension exercises were started on 3rd postoperative day

Patients were made to sit up on the second day, standup with support (walker), on the third day, and were allowed to full weight bear and walk with the help of a walker on the fourth postoperative day depending on his/her pain tolerance and were encouraged to walk thereafter. The patient was advised to use a straight high chair with arms to facilitate getting out of the chair and avoid using a sofa. The patient was advised not to sit cross legged or squat on the floor or squat for Indian style of toilet and patient was advised to use elevated toilet seat.

Suture removal was done on the ninth or eleventh postoperative day discharged from the hospital. Patients who had infection and bedsores were treated accordingly before discharging them from the hospital.

Patients were followed up at an interval of 6 weeks, 3 months, 6 months and 1 year and functional outcome was analyzed by modified Harris hip scoring system5. At each follow up radiograph of the hip was taken for radiological analysis.

Total Functional Result :
The functional outcome after hemiarthroplasty for intracapsular fracture neck of femur was graded as excellent, good and fair after adding the scores given for each criteria for assessment of hip. In Present Series total Harris hip score at the end of twelve months ranged from 24 to 100. Seven (36.84%) hemiarthroplasties had hip scores form 91 to 100 (excellent). Eight (42.10%) had hip scores 81 to 90 (good).

Two hips (10.53%) were rated 71 to 80 (satisfactory) and Two (10.53) were rated 24 to 69 (poor). Thus 78.94% of the hips were classified as having a good to excellent results, 10.53% of patient had satisfactory result and 10.53% of the patients had a poor result. Table 25 shows the observations made regarding the functional results and the type of prosthesis used.

DISCUSSION
Hemiarthroplasty is a common procedure in the treatment of femoral neck fractures in elderly..In this study Twenty cases of fracture neck of femur who were treated by hemiarthroplasty using unipolar Austin Moore's prosthesis were followed up and functional outcomes were analysed and discussed.

Most of the patients were in the age group of 65-79 years with mean average age of 75.55 years. Majority of the fractures were subcapital radiologically.Gender wise distribution shows that females had slight higher fracture rate.This is due to lower peak bone mass and Postmenopausal bone loss in women7.

Majority (90%) of the fractures were due to trivial trauma. Most common associated medical conditions were hypertension, diabetes and gross anaemia. In all cases Moore's posterior approach was used and the appropriate sized prosthesis were selected depending on the of size of the femoral head.In 5 patients 43 mm prosthesis was used ,this was followed by 45mm(4 cases),47mm,49mm(5 cases)each. Small sizes were used because of female preponderance and small build of Indian patients. Patients were ambulated earlv and most of the patients were discharged within 2 weeks of surgery.

Of the 20 cases 1 case died on 34th post op day after hemiarthroplasty.

Thus remaining 19 patients were followed up for the analysis of functional results.

There were 36.84% excellent results and 42.10% good results. Thus there were 78.94% satisfactory results.It is comparable with other standard studies of Hemiarthoplasty with AMP like Dhar et al8 and Moore et al9.

The poor functional results were due to moderate to marked pain in the hip or thigh after hemiarthroplasty

Hemiarthroplasty by using unipolar Austin moore prosthesis is a good option in elderly patients with displaced fracture neck of femur. The operative procedure is simple,with less operative time and less blood loss and mortality and morbidity associated with it is less. The complications are less disabling, weight bearing is early, and functional results are satisfactory.

Limitation of study is that the period of study is less, and sample is small number and a long term assessment is required.

Table.1 Outcome at 3 Months

Hip Score	AMP
Poor (24-69)	2
Fair (70-79)	2
Good (80-89)	8
Excellent (90-100)	7

Table .2 Outcomes at 6 months

Hip Score	AMP
Poor (24-69)	2
Fair (70-79)	2
Good (80-89)	8
Excellent (90-100)	7

Table 3.Outcomes at 1 year

Hip Score	AMP
Poor (24-69)	2
Fair (70-79)	2
Good (80-89)	8
Excellent (90-100)	7

Table 4.radiological changes.

Radiological finding	AMP
Femoral Stem loosening	0
Femoral stem subsidence >5mm	2
Acetabular erosion	0
Protusion	0
Dislocation/subluxation	0
Heterotopic Ossification	0

Table 5.Complications

Complication	AMP
Superficial Infection	2
Hematoma	0
Wound gaping	0
Posterior Dislocation	0
Acetabular Erosion	0
Schiatic Nerve paresis	0
Peri Prosthetic fracture	0
Thigh pain	2

Table 6.Size of AMP prosthesis

Size of AMP Prosthesis	No of patients
43 mm	5
45 mm	4
47 mm	5
49 mm	5

REFERENCES

1. Mark F. Smiontkoski et al. Current concepts review of intracapsular fracture of hip. JBJS 1994 ; 76A : 129 -135.
2. Speed K :.The Unsolved Fracture. Surg Gynecol. Obstet., 1935,6:341-351.
3. Singh M, Nagrath AR, Maini PS. Changes in trabecular pattern of the upper end of the femur as an index of osteoporosis. J Bone Joint Surg Am 1970; 52:457-467.)
4. Elizabeth O Johnson et al. Vascular anatomy and microcirculation of skeletal zones vulnerable to osteonecrosis. Clinical Orthop 2004; 35: 285- 291.
5. HarrisW H.Traumatic arthritis of the Hip after dislocation and acetabular fractures. Treatment by mould arthoplasty. An end result study using a new method of result evaluation,J. Bone Joint Surg Am 1969;51(4):737-755.
6. Ioro R,Healy WL,Lemos DW,Appleby D,Lucchesi C,et al.Displaced Femoral fractures in the elderly:outcomes and cost effectiveness .Clin Orthop. 2001;383:229-242.
7. Osteoporosis Fauci,Braunwald,Kasper,Hauser,longo,Jameson et al (Editors).in Harrison's principles of Internal Medicine 17th edition,Mc Graw Hill.
8. Dinesh Dhar.Early results of Austin Moore Prosthesis in Elderly patients with fracture neck femur.J.Orthopedics2007; 4(1)3.
9. Moore AT.The Self –locking Metal Hip Prosthesis .J Bone Jint Surg Am1957; 39:811-827.