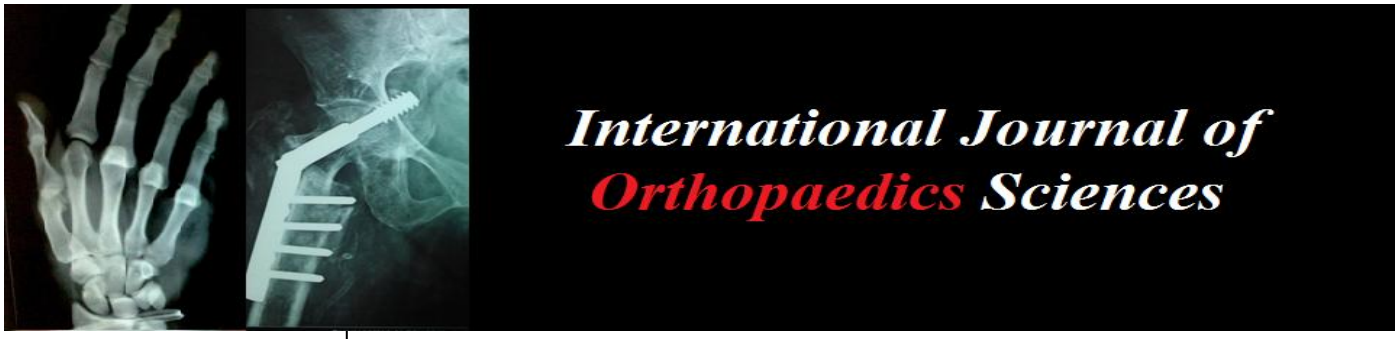

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Comparative study in surgical management of fracture neck femur treated with Austin Moore prosthesis and bipolar prosthesis

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Abstract
Introduction: It is a study of comparison of hemiarthroplasty with Austin Moore Prosthesis and bipolar. We wanted to know the efficacy of both the prosthesis. Hemiarthroplasty has been considered to be one of the gold standard modality in fracture neck femur management since years for elderly patients. Hemiarthroplasty provides better facilitation for the patients especially old age as the patients can be mobilised as early as 1st post op day as compared to internal fixation.
Materials and Method: The study consist of 32 patients with fracture neck of femur. We have treated patients with Austin Moore Prosthesis and Bipolar Prosthesis. Clinical outcome and function results were evaluated by Harris Hip Score.
Result: We have operated total 32 cases of fracture neck of femur. In which 16 cases were operated with Austin Moore Prosthesis and 16 patients were operated with Bipolar Prosthesis. We have achieved 87.5% of excellent to good result in Bipolar and 75% of excellent to good result in Austin Moore Prosthesis.
Conclusion: It being a short term study the results of both the groups, i.e. group A (Austin Moore Prosthesis) and Group B (Bipolar prosthesis), are comparatively similar. And the notion that bipolar prosthesis after certain time behaves as a unipolar prosthesis turns out to be correct as supported by various studies in present study as well and thus the results of both the groups stands out to be more or less similar.

Keywords: Surgical management, neck femur, Austin Moore prosthesis, bipolar prosthesis

Introduction
Fractures of the neck of the femur are the common fractures encountered by an orthopaedic surgeon in their practice especially in elderly patients. The incidence of these fractures and the problems related to them seems to be increasing, mainly the increase is in elderly population in whom osteoporosis is very common.
There are high chances for the fracture neck femur to go into non-union or avascular necrosis because of its precarious blood supply, absence of cambium layer of periosteum, effect of synovial fluid and tamponading effect of the intracapsular hematoma.
Reduction and internal fixation of the fractures is the treatment in younger patients whereas primary arthroplasty is better in case of elderly even with undisplaced fractures to avoid problems of prolonged recumbancy and have a faster rehabilitation. In displaced fractures chances of avascular necrosis are high and non-union leading to a high failure rate [1-3] re-operation rate [2], poor functional outcome [3] and mortality [4].
Hence primary arthroplasty is recommended for displaced fractures of the neck of femur [3] in elderly patients. With various options of unipolar, bipolar or total hip arthroplasty, it would be advisable to choose hemiarthroplasty as it being a procedure with a short operating time with lesser morbidity and is suitable in patients with lesser life expectancy [5].
Hemiarthroplasty of the hip was used extensively in 1943 by Moore and Bohlman, who fashioned a custom metallic femoral head and neck prosthesis for patients suffering from proximal femoral shaft tumor [6]. Earlier these prostheses were the unipolar replacement of the femoral head, which were used in the 1940's by Judet and Judet. Subsequently, commercially available fixed head prosthesis acquired widespread popularity, especially the Moore and

Thompson hip end oprosthesis. Their placement has become acceptable treatment for acute displaced femoral neck fracture in elderly patients or for acute femoral neck fracture in neurologically handicapped or poor surgical risk patients [6].
Austin Moore and Thomson's hemiarthroplasty have given good results. But in these prostheses, it is the head size which decides the size of the stem which will fit in the femur. This lack of modularity and problems like joint pain, acetabular erosion, protrusion acetabuli, has led to a decrease in their use. In 1974, James Bateman introduced the bipolar prosthesis. The complication of acetabular erosion and pain are reduced by use of Cemented Bipolar prosthesis, but the cost still precludes its use especially for patients in India which majorly belongs to lower economic strata.
Modularity tends to be cost effective, as it offers the surgeon a very wide range of prosthetic sizes without significantly increasing hospital inventory. Wathne and co-workers [7] could identify no differences in the perioperative care, revision rates or the 1-year outcomes in a prospective study comparing 140 elderly patients treated with any of cemented modular bipolar and unipolar prosthesis. They reported no advantages identified in using the bipolar device, despite a greater cost. More over there is increasing literature which state about loss of movement between the two bearing surfaces of a bipolar, which ultimately functions as a unipolar. Thus, this study is aimed at comparing the functional outcome obtained after a hemiarthroplasty in elderly patients with fracture neck of femur using Austin Moore's prosthesis and modular bipolar prosthesis and to compare the complications in such cases.

Material & Methods

Study Area

The present study was conducted at a tertiary care hospital which is secondary care multispecialty hospital. It caters to suburban population of metropolitan area of vadodara.

Study Sample Size: 34 patients who were admitted and operated between 18 months and had fulfilled the inclusion criteria were enrolled for this study. Patients operated with Austin Moore's prosthesis were allocated to Group A and those operated with bipolar Prosthesis were allocated to Group B. 17 patients each were allocated into 2 groups A and B. 1 patients from each group were lost to follow up due to death. 32 patients who completed follow up till one year postoperatively were included in this study.

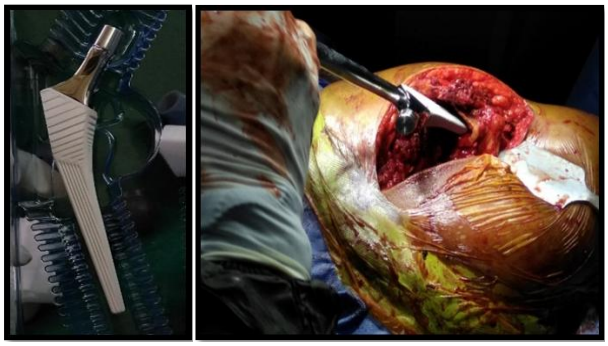
- Study Type: Prospective study.
- Study Design: Comparative with two groups
- Study Title: Comparative study in surgical management of fracture neck of femur treated with Austin Moore prosthesis and Bipolar Prosthesis.
- Duration of study: 18 months.

Inclusion Criteria

- Age of patients 40 years and older.
- Patient ambulatory prior to fracture
- Patient giving informed consent for inclusion in the study.

Exclusion Criteria

- Any other ipsilateral or contralateral fractures in the lower extremity.
- Any associated upper limb fracture.
- Patients with associated neurological disorders.



Bipolar Prosthesis

Austin Moore Prosthesis

Post-Operative Protocol

- Post-operative and mobilization protocol was same for all patients.
- Leg in 30° abduction with a pillow in between the thighs.
- Foot end elevation for one day.
- Deep vein thrombosis prophylaxis if high risk.
- Post-operative Antero-Posterior X-ray of operated hip.
- Post-operative Haemogram and Serum Electrolytes done immediate postoperatively and 24 hrs post operatively.
- Static exercises in bed for glutei, hamstrings and quadriceps and breathing exercises.
- Drain removal after 48 hrs.
- Sitting on 1st day with active and passive exercises in bed.
- Partial to full weight bearing walking on operated side with the help of a walker from 2nd day onwards according to pain tolerance.
- Postoperative dressings on 2nd, 5th and 8th day.
- Suture removal on or after 12 days.
- Patient discharged after full rehabilitation.
- Prior to discharge check done for late clinical sepsis and deep vein thrombosis.

Follow-Up Protocol

Post-operative visits were scheduled at 6 weeks, 3 months, 6 months and 1 year. Clinico-radiological and functional assessment were carried out. All patients were functionally assessed using the Harris Hip Score and complications, if any, were documented.

Functional Outcome Assessment

Harris Hip Scoring System: Formulated by W. H. Harris.
It incorporates all-important variable into single reliable figure, which is both reproducible and reasonably objective.

Point scale with maximum of 100 points:

Pain	44
Function	47
Range of motion	05
Absence of deformity	04
Total	100

The score is reported as

1. 90-100 -excellent results,
2. 80-89 - good,
3. 70-79- fair,
4. 60-69 -poor, and
5. Below 60- a failed result

During each follow up functional outcome measured according to Harris hip score and clinic-radiological assessment was done

Result

Age Incidence

In the present study the patients were taken from the age ranges as shown in below table. The mean age in Group A is 69.41 years and that in Group B is 69.23

Sex Incidence

In this study the number of females in Group A is 10 compared to 5 in Group B. And number of males in Group A is 7 compared to 12 in Group B as shown in below table.

Early Post-Operative Complication

In this study we had 2 patients of superficial infection one in each group, and one case of dislocation in Group A. There were two deaths in our study one from each group. Death was due to the medical cause.

Average Follow Up Period

In this study all the 32 patients were followed up for minimum of 12 months and maximum of 18 months patients. Average follow up of patients of Group A and Group B is 14 months.

Distribution according To Garden's Type

In this study we have distributed the patients based on type of fracture they presented with. We had 9 patients with garden type 3 in Group A and 12 in Group B and had 8 patients with garden type 4 in Group A and 5 in Group B.

Comparison of cemented and Uncemented bipolar

In this study we had 87.5% excellent to good result in bipolar with cemented as well as Uncemented and 12.5% fair result in both the prosthesis.

Assessment of Limp at the end of 1 year follow up

In this study at the end of final follow up 13 patients from Group A had no limp compared to 15 patients from Group B. where as 3 patients from Group A and 1 from Group B had slight limp at the end of 1 year follow up.

Late post op comlications

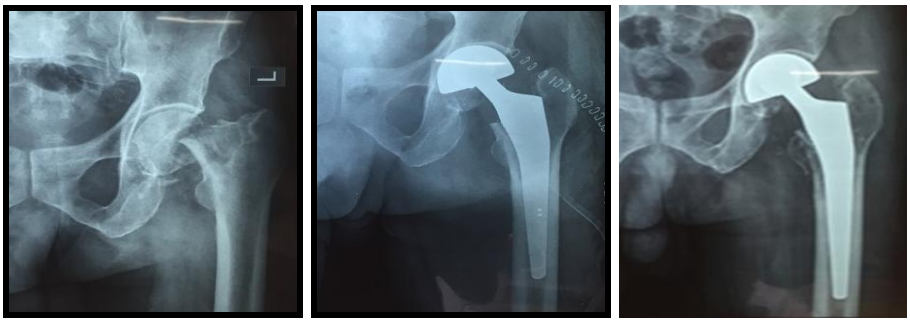
In our study we had 2 late complications namely stem subsidence and Stem lossening. There was 1 patient with stem subsidence in Group A and 2 patients with stem loosening in Group B.

Assessment of walking at final follow up

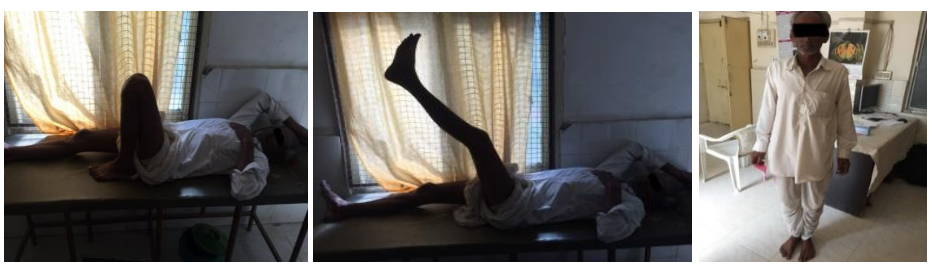
In this study at the final follow up we found out that 11 patients from Group A needed support of stick or cane for a long walk compare to 7 patients in Group B. whereas 9 patients in Group B required no support to walk compared to 5 patients in Group A.

Mean Changes in Functional Score after the Treatment

- At 3 months follow up, mean functional score was 77.94 in Group A which as compared to 81.88 among Group B subjects was significantly less.
- After 6 months mean functional score increased among both the groups and was 83.44 in Group A subjects and 85.63 in Group B subjects which was comparable and difference was not significant.
- After the end of 12 months, mean score was 87.50 in Group A which was comparable to 90.30 in Group B subjects.

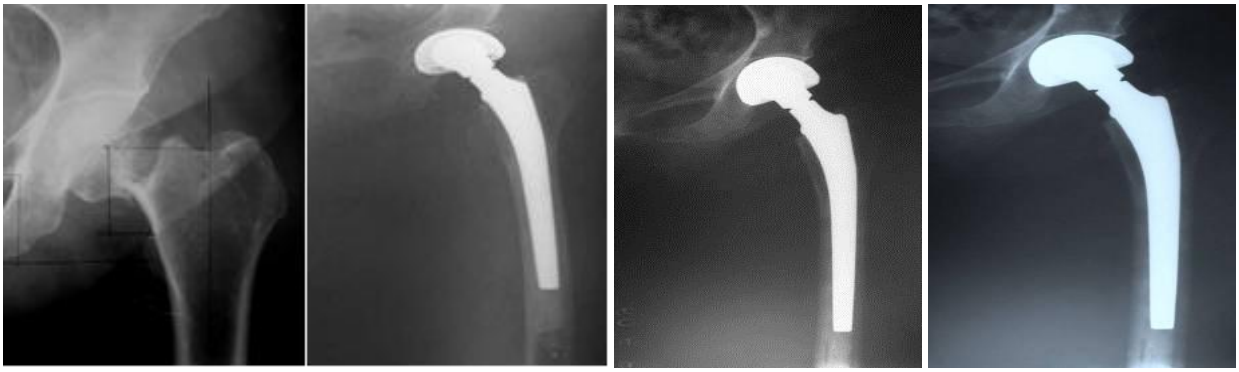


Preoperative x-ray post-operative x-ray final follow-up x-ray



Clinical Pictures at final follow up

Cases 1



Pre- op x ray | post op X ray | 6 months follow up | 1 year follow

Case 2

Discussion

Hip fractures are devastating injuries that most commonly affect the elderly and have a tremendous impact on both the health care system and society in general. Despite the marked improvements in implant design, surgical technique and patients care hip fractures consume a potential proportion of our health care resources.

The elderly patients have problems like osteoporosis which when treated with internal fixation pose problems to the hold of the implant, and hence requiring prolonged immobilization for achieving bony union. On the other hand, there is a need for rapid mobilization with weight bearing for these patients, as these patients are generally medically compromised due to age and co-morbid conditions. With internal fixation, there is a significantly high rate of reoperation of 34% and 36% as compared to 18% and 10% in hemiarthroplasty, more pain than with arthroplasty, and decreased earlyfunction. A better functional outcome is achieved with arthroplasty than with internal fixation.

An elderly age group of people above i.e. 60 years of age were most commonly encountered of having fracture neck femur. In our study, mean age in Group A and Group B was 69.41 years and 69.23 years respectively out of which 19 were male and 15 were female. The age predilection to the elderly age group people can be explained as they are the one most commonly affected with this fracture due to osteoporosis being the main cause. Nottage *et al.* [6] reported mean ages in Bateman Bipolar and Moore's prosthesis to be 65 and 73 years respectively.

In our study we had 12 patients with household as their prefall ambulatory status and 22 patients with community as their ambulatory status. By household ambulatory status we mean to describe the patients who did household chores or were retired and had hardly any strenuous activity to do and viceversa for the community ambulatory status.

In our study we had patients with fracture that can be classified to gardens type 3 and 4. There are 21 patients with garden type 3 and 13 with garden type 4.

In our study we had 19 patients with the left sided fracture neck femur and 12 patients with the right sided fracture neck femur.

In our study out of 34 patients 32 were followed up for a minimum of 12 months period. 2 patients died due to medical cause and were excluded from the final outcome assessment. There were 16 patients in each group and the outcome at the end of one year follow up was compared and evaluated. Lower rate of mortality comparable to other series is probably due to less number of sample size, proper selection of cases, proper management of the associated medical problems preoperatively, routine use of antibiotics and most important was early mobilization. Calder *et al.* in his prospective study reported 30% mortality rate at 1 year in both groups. Hudson *et al.* [4] in an 8 year retrospective review of 90 unipolar and 48 bipolar hemiarthroplasties showed no statistically significant differences in the rates of mortality, surgical complications or other events including medical complications. Long and Knight as well as Drinker and Murray showed that there was little difference between the unipolar and bipolar endopros theses in terms of rapid postoperative mobility of the patient, operative morbidity and mortality.

In our study we had immediate post op complications in 3 patients. The immediate post op complication encountered in our study were superficial infection and dislocation.

There were 2 cases of superficial infection 1 in each group. Both the patients had to be taken for debridement and then were kept on iv antibiotics for 4 weeks and then two weeks of oral antibiotic. Infection was treated with this and did not occur again and both this patient had good result at the end of one year follow up. The rate of infection has been kept low by use of various measures like use of prophylactic antibiotics and keeping the operation room environment clean by laminar ventilation system. In literature the infection rate has been reported to be about 4-6% when posterior approach is used for arthroplasty due to proximity of the incision to the perineum which is comparable with our study. Patient who developed infections had to stay longer in the hospital. Management of superficial infections was done with appropriate frequent dressings and antibiotics according to culture and sensitivity reports. In our study we did not encounter any deep infection.

In our study we had 1 case of posterior dislocation in Group at 2 weeks post op and patient was treated with closed reduction and kept on ankle traction and 30° abduction for 3 weeks. It did not recur again. We didn't have any case of dislocation from Group B. We believe that was due to dual mobility of bipolar prosthesis which makes it less prone for dislocation. But if it gets dislocated it becomes more difficult to reduce it due to the modularity of neck and head. R. Malhotra *et al.* noted in his study that open reduction was required in bipolar case as shape of prosthesis is not globular but has an offset at the head because of superimposed UHMWPE cup. In this study the probable cause of dislocation was extreme position of flexion and adduction by patient. Ko *et al.* in his study of 1832 hemiarthroplasties found that posterior approach cannot be substantiated as the most common cause of dislocation. He suggested that assessing the causes of the event is of utmost importance rather than comparison of rates of dislocation. More often the etiology of postoperative dislocation is multifactorial involving number of surgical and patient related factors. In the current study, in both groups we used posterior

Moore's approach, but we did repair the external rotators and the posterior capsule properly. Maintenance of proper ante version, adequate soft tissue tension, lack of rotation of stem in canal, a sound repair of posterior sleeve, proper repair of fascia lata, iliotibial band and gluteus maximus insertion are many of the necessary steps to minimize the chances of dislocation. Yao and Keller *et al.* [2] in their meta-analysis found rate of dislocation 2%, 3% and 11% with unipolar, bipolar and total hip prostheses respectively. Some randomised trials show identical rate of dislocation for both unipolar and bipolar prostheses. In our study rate of dislocation with bipolar prosthesis is nil and with Austin Moore prosthesis is 6.25%. Weinrauch *et al.* noted that Austin Moore prosthesis dislocates due to inappropriate residual neck length and poor selection of prosthetic head size. Kodo *et al.* found that dislocations occurring within 5 days of Austin Moore's hemiarthroplasty are reduced closed but those occurring after 5 days required open reduction contarary to our study where dislocated AMP was reduced by closed reduction at 2 weeks post op. Drinker and Murray found that dislocation of unipolar prosthesis was reduced successfully with closed methods and dislocations of bipolar reduced by open methods. Interprosthetic dislocation of a bipolar prosthesis in which the head separates from the stem invariably leads to open reduction. Failure of closed reduction is related to disassembly of bipolar prosthesis.

Various studies have found that pain is more common with uncemented prosthesis than cemented ones but Stavrakis *et al.* did not find any significant difference with respect to postoperative pain between cemented and uncemented prostheses which can be compared to our study with 62.5% patients from Group A and 68.75% patients from group B had none to slight pain. Whereas 37.5% patients from Group A and 31.25% patients from Group B had mild pain having no effect on average activities.

In our study at the end of final follow up we had 81.25% patient in Group A and 93.75% in Group B with no limping whereas 18.75% patient in Group A and 6.25% patient in Group B had slight limp. This difference can be explained with the fact that offset in bipolar can be corrected with its advantage of modularity as compared to non-modularity of Austin Moore Prosthesis as the verticle and horizontal offset cannot be set to anatomical offset and moreover it also has short fixed neck length.

In our study at the end of final follow up there were 68.75% patients in Group A and 43.75% patients in Group B who needed support of cane or stick to walk for longer distance but they could do the daily activity without any support whereas 31.25% patients in Group A and 56.25% patients in Group B needed no support at all. The patients who had undergone bipolar prosthesis we observed that less no. of patients had limp and also less patients required cane/ stick for ambulation comparatively.

In our study we encountered 3 cases of late post op complications. 1 of stem subsidence in Group A and 2 of stem loosening in Group B.

The patient with stem subsidence in Group A was followed up with serial x ray at regular follow up and no further subsidence was noticed and this patient had fair result at the end of final follow up but still complained of pain in thigh. Yau *et al.* suggested subsidence and pivoting of the prosthesis as the cause of hip pain after Austin Moore hemiarthroplasty. Significant increase in subsidence was noted if the stem of prosthesis was not fitting well within shaft of femur. Jadhav *et al.* said that pain affects function. Some studies suggest fill of Austin Moore prosthesis within shaft of femur should be more than 70% to avoid early loosening and relatively younger patients with acute fracture neck of femur should be treated by methods other than cementless Austin Moore prosthesis.

There were two cases of loosening in Group B out of which one was operated for revision surgery with cemented bipolar after 1 year and other patient had pain which was tolerable for him and so was followed up regularly with x-ray this patient had fair result at the end of 12mnths follow up. Compared to this Yamagata, Chao *et al.* observed rate of reoperation was 12.5% with fixed head endoprosthesis and 7% with bipolar prosthesis. Cause of reoperation within first 2 years was dislocation and after two years were acetabular erosion and loosening of the femoral stem. Similarly Lausten in 1987 studied 75 pts with bipolar hemiarthroplasty done for femoral neck fractures, at an average of 54 months follow up, 3 required revision and 3 had protrusion, 10 with significant radiolucencies around femoral stem with 75% good to excellent results.

In our study the outcome at 1 year follow up in bipolar with cemented and Uncemented was excellent to good in 43.75% stating no difference in outcome. Lars Nordsletten *et al.* in his study on Cemented versus Uncemented Hemiarthroplasty for Displaced Femoral Neck femur showed that The primary functional outcome measure, HHS after 1 year, was equivalent between the two groups. Gjertsen JE, Lie SA, Vinje T, Engesæter LB, Hallan G, Matre K, *et al.* showed in their study that the rate of reoperation was more after uncemented than cemented hemiarthroplasty used in the treatment of displaced fractures of the femoral neck which can be compared to our study in which one Uncemented had to be revised with cemented bipolar as discussed above. Thus as the age advances Uncemented prosthesis should not be preffered.

In our study We have evaluated our results in comparision with help of follow up at 3 months, 6 months, and 1 year with HHS. As per analysis at 3 months of the duration 37.5% of the subjects in Group A had Excellent to good effect of the treatment which was less compared to 56.25% of the case among Group B but the difference was statistically insignificant. After 6 month of the treatment 87.5% of the cases among the Group B had excellent to good effect of the treatment which was significantly more compared to 62.5% of the cases among Group A. 87.5% of the subjects in Group B had excellent to good functional outcome which was more compared to 75% of the cases in Group A at the end of 1 year. Moore [15] in 1957 reported that results by using Austin Moore endo-prosthesis in 60 non-institutionalized patients, describing a minimum 2 year follow up period had good or excellent results in 75% which can be compared to our study in which after 1 year follow up good or excellent results were obtained in 75% cases treated with Austin moore prosthesis. While comparing with other studies it was found that, Cornell *et al.* performed a prospective six month follow up of 33 bipolar and 15 unipolar hemiarthroplasties and found no significant differences between the 2 groups in terms of functional recovery and rates of postoperative complications. In our study also we found no significant difference in rate of postoperative complications being 18.75% in both the group, and Kenzora *et al.* in a prospective outcome study at 24 months of follow-up of 195 bipolar and 75 unipolar hemiarthroplasties showed that patients who underwent bipolar hemiarthroplasty had better pain relief and function. Which can be compared to our study.

In our study, in group operated with Austin Moore's prosthesis, 71.43% household ambulatory, 77.78% community ambulatory achieved excellent to good outcome while all household and 81.81% community ambulatory patients in group operated with Bipolar Prosthesis achieved excellent to good outcome. In 2010, Sepah and Umer *et al.* reported that 75% community ambulators and 66.6% household ambulators were able to regain functional status at end of 6 months. In the comparative study between unipolar and bipolar prosthesis by Bernard Ong *et al.* 43.8% patients operated with bipolar and 35.2% patients operated with unipolar have good recovery of ambulation. This can be compared to our study where 87.5% patients operated with bipolar have good to excellent recovery of ambulation and 75% of patient operated with Austin more prosthesis have good to excellent recovery of ambulation.

Nottage *et al.* [6] reported a mean HHS of 85 in case of bipolar hemiarthroplasty and 77 in cases operated with Austin Moore's prosthesis though the p value was not significant. The results in the current study were comparable to those mentioned above that is mean HHS of 90.3 in Group B and 87.50 in Group A.

Superiority of bipolar over unipolar prosthesis has been reported with respect to decreased or absent acetabular erosion. Some studies suggest the findings with reference to acetabular erosion in unipolar and bipolar prostheses appeared to be quite similar [20]. In 1987, Phillips reported the fluoroscopic study of movement over a period of 4yrs of Bateman bipolar femoral head arthroplasty. The implant functioned as bipolar hip prosthesis with movement mainly at the inner metal on polyethylene surface in hip arthritis to the other cases in which in 75% were of the fracture group and the prosthesis functioned largely as a unipolar device with movement occurring mainly at the outer metal on cartilage surface. The factors that have best correlated with the severity of acetabular erosion are patient activity level and duration of follow up. In our study we did not find acetabular erosion with either prosthesis at the end of 1 year. To detect the acetabular erosion it may be necessary to follow patients for a period longer than three years.

Strengths of the Study

The strengths of our study include:

- This study was conducted at a single center.
- The surgeries were done by 3 senior surgeons, so the bias involved with good functional results in hands of a single surgeon are nullified.
- The patients were properly followed-up at appropriate periods to minimum of 12 months and evaluated by the operating surgeon and a physiotherapist independently.
- The results were analyzed by appropriate statistical analysis as the study demanded which thus improved the strength of the study.

Weaknesses of the Study

- Short term results at 1 year follow-up are assessed, however long term studies have to be planned to evaluate the results of this study.
- Smaller sample size
- Study carried out at single center

Conclusion

Total 32 cases of fracture neck femur in older age group all were treated with hemiarthroplasty. 16 were treated with Austin moore prosthesis and remaing 16 with Bipolar prosthesis (cemented/ uncemented). Results were analysed as per harris's hip score with patients being followed up for minimum of 1 year. At the end of final follow up the mean HHS for group A patient was 87.50 and that of group B patient was 90.30

At the end of 1 year follow up group A had 75% of good to excellent results and that of group B had 87.5% good to excellent result but the difference was not significant. Results improved with time in both the groups comparatively more so in group B but results are almost similar and that can be due to the short term follow up study.

In present series as compared to other series we had fewer cases having complication like acetabular erosion and femoral subsidence, thus we had fewer no. of cases that went for revision. This can be explained by the fact that our cases had short term follow up. Long term follow up might have given us a different picture.

Cases having posterior dislocation and infection were comparatively less in our study. There was no case having peri-prosthetic fracture.

Contrary to other study we found no significant difference in pain in patients operated with unipolar and bipolar prosthesis.

We agree with Dalldorf that progression of degeneration is correlated directly with the duration of articulation of implant with the acetabulum.

Almost similar results between two groups tend us to believe that bipolar prosthesis functioned largely as a unipolar device with movement occuringmaily at the outer metal on cartilage surface.

But bipolar is having added advantage of modularity meaning small, medium and large neck and various sizes of head are available decreasing the chances of limb length discrepancy. And the patients who had undergone bipolar prosthesis we observed that less no. of patients had limp and also less patients require cane/ stick for ambulation comparatively.

We can say that even today for a poor patient in country like India AMP stands out to be a better option.

Whether the polarity or the modularity of the hemiarthroplasty system is more important in achieving better functional outcome can be determined by further randomized control studies.

Summary

Following are the details of clinical information collected from our study. Out of 34 patients enrolled in the study, 2 patientsone from each Group were excluded from study as they died due to medical cause unrelated to surgical process.

- Of 34 patients, there were 15 females and 19 males. The youngest patient in our series was 60 years and the oldest 82 years. The average age of the patient was 69.41 years in Group A and 69.23 years in Group B.
- The patients walked (partial weight bearing) on an average 3 days after surgery. Out of the 34, 2 patients expired due to unrelated causes. Remaining 32 patients were followed up for minimum of 12 months.
- Two patients in this study developed superficial infection one in each group. In both of them infection subsided within 2 weeks of intravenous antibiotics and debridement. 1 patient of Group A developed stem subsidence seen at 3 months follow-up. He was further observed on serial X rays but they did not have any more changes later.
- One patient of Group A had dislocation at 2 weeks post-operatively due to patient noncompliance. It was treated by closed reduction. Which did not displace again.

- No loosening, erosions or deep infections occurred in Group A till last follow up in our study. There was loosening of 2 patients in our study in Group B which were operated with uncemented bipolar and 1 had to be revised with the cemented bipolar.

Reference

1. Bray TJ. The displaced femoral neck fracture: internal fixation versus bipolar endoprosthesis. Clin Orthop. 1988; 230:127-40.
2. Lu-Yao GL. Outcomes after displaced fractures of the femoral neck: a meta-analysis of 106 published reports. JBJS Am. 1994; 76-A:15-25
3. Rogmark C. A prospective randomized trial of internal fixation versus arthroplasty for displaced fractures of the neck of femur. JBJS Br. 2002; 84-B:183-8.
4. Hudson. 8 yr outcome associated with clinical options in management of femoral neck fractures. Clin Orthop. 1998; 348:59-66
5. Narayan KK, George T. Functional outcome of fracture neck of femur treated with total hip replacement versus bipolar arthroplasty in a South Asian population. Arch Orthop Trauma Surg. 2006; 126(8):545-8.
6. Nottage, McMaster. Comparison of bipolar implants with fixed neck prostheses in femoral neck fractures. CORR. 1990; 251:38-43.
7. Wathne RA, Koval KJ, Aharonoff GB. Modular unipolar versus bipolar prosthesis: A prospective evaluation of functional outcome after femoral neck fracture. J Orthop Trauma. 1995; 9:298-302.
8. Smith JAR, McLauchlan J. A survey of fractures of proximal end of femur. Injury feb. 1975; 6(3):196-201
9. Cooper JA. The classic: fractures of the neck of the thigh-bone. Sir Astley Cooper, BART, F.R.S., surgeon to the King. Clin Orthop 1973; 92:3-5.
10. Smith-Petersen MN. Evolution of mould arthroplasty of the hip joint, J Bone Joint Surg. 1948; 30B:59.
11. Whitman R. The abduction method. Considered as the exponent of a treatment for all forms of fracture at the hip in accord with surgical principles. Am J Surg. 1933; 21:335-349.
12. Leadbetter GW. closed reduction of fractures of neck of femur. JBJS. 1938; 20:108.
13. Judet R, Judet J. Technique and results with the acrylic femoral head prosthesis, J Bone Joint Surg 1952; 34B:173.
14. Thompson FR. Two and a half years' experience with a Vitallium intramedullary hip prosthesis, J Bone Joint Surg. 1954; 36A:489.
15. Moore AT. The self-locking metal hip prosthesis, J Bone Joint Surg. 1957; 39A:811.
16. Charnley J. Total hip replacement by low-friction arthroplasty, Clin Orthop. 1970; 72:7.
17. Bateman JE. Single-assembly total hip prosthesis preliminary report, Orthop Dig. 1974; 2:15.
18. Jensen, Holstein. A long term follow-up of Moore arthroplasty in femoral neck fractures. Acta Orthop Scand. 1975; 46:764.
19. Kofoed H, Kofoed J. Moore's prosthesis in the treatment of fresh femoral neck fracture: A critical review with the special attention to secondary acetabular degeneration, Injury 1983; 14:531.
20. Kaltsas, Klugman. Acetabular erosion – a comparison between Austin Moore and monk hard top prosthesis. Injury. 1986; 17:230-236.