Original Article

Hemiarthoplasty

Results of Hemiarthoplasty in Basicervical Fracture Neck of Femur (Gardon Type-III & IV) using Austin Moor Prosthesis and their Assessment in Terms of Charnley Hip Score and Harris Hip Score

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ABSTRACT

Objective: To determine the long term results of Hemiarthoplasty with Austin Moor Prosthesis and to evaluate the results in terms of Harris hip score and Charnley hip score.
Study Design: Experimental study.
Place and Duration of Study: The study was conducted at Khawaja Muhammad Safdar Medical College/Allama Iqbal Memorial Teaching Hospital, Sialkot from January, 2001 to December, 2011.
Materials and Methods: Total 55 patients 40 male (72.72%) and 15 female (27.27%) were selected for study after Hemiarthroplasty with Austin Moor Prosthesis in elderly patients. The age range from 60 to 95 years with an average age of 68 years. 34 patients (61.81%) had Gardon type-III and 21 patients (38.18%) had Gardon type-IV fracture neck of the femur.
Results: Post operatively, all patients were assessed radiologically as well as clinically with dual assessment scale using Harris hip score (pain 44 point, function 47 point, deformity 4 point, range of motion 5 point) and Charnley hip score in terms of pain, movement and walking ability with scale of 1 to 6. One being totally disable and six being a normal status. According to H.H.S. we noted 78.18% excellent, 14.54% good and 7.27% poor result at five years follow up and 70.83% excellent, 14.58 good and 14.58% poor results between five to ten years follow up in our study. As per Charnley hip score scale we noted 96.85% satisfactory results and 3.63% poor results at five years follow up and 77.08% satisfactory results at 5 to 10 years follow up in our study. The complications noted during follow up include; infection in 5 patients (9.09%), pain 10 patients (18.18%) shortening in 03 patients (5.45%), scatic nerve injury with foot drop (0%). According to radiological assessment, we noted dislocation in 1 patient (1.08%), acetabulum protrusia in 2 patients (3.63%), osteolysis 5 patients (9.09%), calcar resorption 5 patients (9.05%), loosening of implant patients (12.72%)
Conclusion: Hemiarthroplasy in type-III and IV Basicervical fracture at the neck of femur with Austin Moor Prosthesis is simple, safe and cost effective method with low incidence of mortality and morbidity in old age patients and gives safely 8 to 10 pain free years to the patients.
Key Words: Basicervical fracture nech of femur, Gardon Classification, Hemiarthoplasty, Austin Moor Posthesis, Harris hip score (HHS), Charnley Hip Score.

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INTRODUCTION

Fracture neck of the femur is the most common fracture in elderly patient above 60 years of age and its treatment is challenging for an orthopaedic surgeon due to high mortality and morbidity. With increase life expectancy the number of elderly people are increasing and it is estimated that number of hip fractures will rise from 1.66 Million in 1990 to 6.26 Million by 2015. In Germany it is forecasted that there will be rise of 74% in the incidence of Proximal Femoral fracture by the year 2020. According to Swedish National Hip Fracture Register, Intracapsular fracture of femoral neck constitutes 53% of hip fractures with 33% undisplaced and 67% displaced[1,2,9].

The fracture neck of the femur has drawn its importance because of difficulty in achieving reduction, maintenance of reduction and avascular necrosis leading to reintervension rate of 35% with decreased function and increase morbidity as reported by Lu-Yao[12,23,24,28].

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The risk factor for mortality includes development of one or more post-operative complications like chest infection leading to pneumonia, deep vein thrombosis, UTI leading to renal failure, muscle wasting and bedsores. Early and effective mobilization is the key to success to decrease mortality and morbidity in this age group patents. Replacement of femoral head and neck with Prosthesis is an effective way to get rid of these dreadful complications and to prevent the complications of internal fixation which leads to avascular necrosis and reintervention, hence increasing morbidity and mortality. There are different schools of thought for management of these fractures and there is no consensus on how to treat patients with displaced intracapsular fractures. It is because of poor clinical date that the displaced intracapsular fractures are referred to as "the unsolved fractures"[1,2,3,4,5,16,17,22].

Moor and Bohlman after removal of joint cell tumor of femoral head introduced Hemiarthroplasty in 1940. Later on Dr. Austin Moor (1899-1963), form south Carolina performed 1st Hemiarthroplasty for fracture neck of femur in 1942 to which he gave his name.

The credentials of hemiarthroplasty as treatment of choice in Gardon type-III and IV fractures in old age patients has been under cloud due to advent of newer type and designs of Bipolar and total hip orthoplasties. But considering the old age, poor medical conditions, osteoporosis, long duration of surgery, more blood loss in already compromised patients, associated cardiovascular complications due to use of bone cement during surgery and above all the economical factor; hemiarthplasty is advocated as the best treatment for transcervical fractures in elderly patients due to early rehabilitation thus preventing the dreadful complication of non-union and avascular necrosis. Currently two types of endoprosthesis are in common use; Thompson type and the Moor type. The moor type is more popular as it distributes stresses over wide area in proximal femur minimizing shear stresses[3,4,5,17,19,20,22,23].

Although there are various reports in literature indicating the good results of A.M Prothesis but there are no longterm data is available. We have studied the long term results of A.M Prothesis in Basicervical Gardon type-III& IV fracture neck of the femur in our hospital and evaluating their results in terms of Harris hip score and Charnley hip score to assess the long term results[7,14,22,25,28].

MATERIALS AND METHODS

Total 55 cases were operated and selected for study from January, 2001 to December, 2011 and followed up for a period of 10 years with an average follow up of 8 to 10 years. Out of 55 patients 40 patients (72.72%) were male and 15 patients (27.27%) were female. The minimum age of the patients selected for study was 60 years and maximum was 95 years with an average age of 68 years. The age range between 60 to 65 years in 18 patients (32.72%), 65 to 80 years in 22 patients (40%) and more than 80 years in 15 patients (27.27%). Average period between injury and surgery was after one to four weak of trauma. Out of 55 patients 34 patients (61.81%) had Gardon type-III and 21 patients (38.18%) have Gardon type-IV fracture neck of femur. All pateints were assessed pre-operatively both by the physician and anesthetist and written consent was taken before surgery. All patients were evaluated by routine medical tests which include Blood C/P, HB, Sugar, Urea, Creatinine, LFTs, HBs, HCV, Blood Grouping, ECG, X-ray Chest and Pelvis. Old Bed ridden patients pathological fractures, open fracture, Hemiplegia of the effected limb, liver cirrhosis with ascites, uncontrolled diabetes with associated complications, fracture more than 3 months duration, old age problems like dementia, parkinsonism and all other patients unfit from anaesthesia point of view were not selected for surgery. Inclusion criteria was active patients who wanted to fight against the disease with better quality of bone with respect to their age were selected for surgery. Prophylactic antibiotics were given to all patients. All patients underwent Austin Moor Hemiarthoplasty. Postoperatively all patients were mobilized with the help of crutches or walker along with range of motion and quadriceps exercises. All patients were discharged 3rd to 4th day after surgery with the advice to come for the removal of stiches two weeks after the surgery. They were advised to come for follow after two weeks for one month, then after 3 to 6 months and later on after one year till the completion of study. During follow up all patients were assessed both clinically in terms of Harris hip score and Charnley hip score in order to evaluate the results. The radiological assessment was made with special reference to fracture of implants, dislocation, Acetabulum Protrusia, Oestolysis, Calcar resorption and loosening of implants. The complications associated with procedure like wound infection, pain, shortening, sciatic nerve injury with foot drop was also observed along with dual assessment scale using HHS and Charnley hip score.

Statistical programme for social sciences (SPSS) version 15 was used to analyse the data, Chi-Square statistical test was also applied to know the significance of various results.

RESULTS

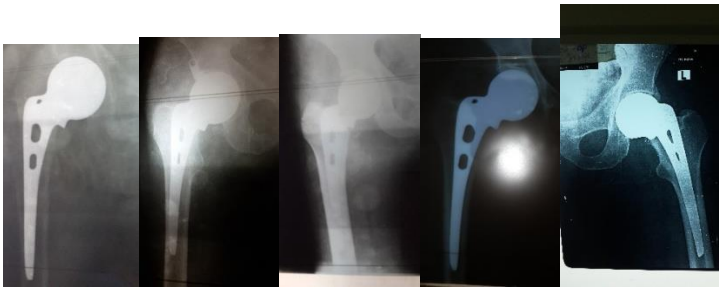
The mean operating time was 25 to 35 minutes, while the mean follow up period was 8 to 10 years. None of the patients died during hospital stay. All were discharged in satisfactory conditions out of 55 patients operated 2 patients (3.63%) died within 5 years of surgery due to associated medical conditions, 5 lost to follow up and remaining 48 patients were followed up from 8 to 10 years after surgery. All patients were assessed according to Harris hip score and charnley hip

score initially at 5 years and then at the end of the study along with radiological assessment.

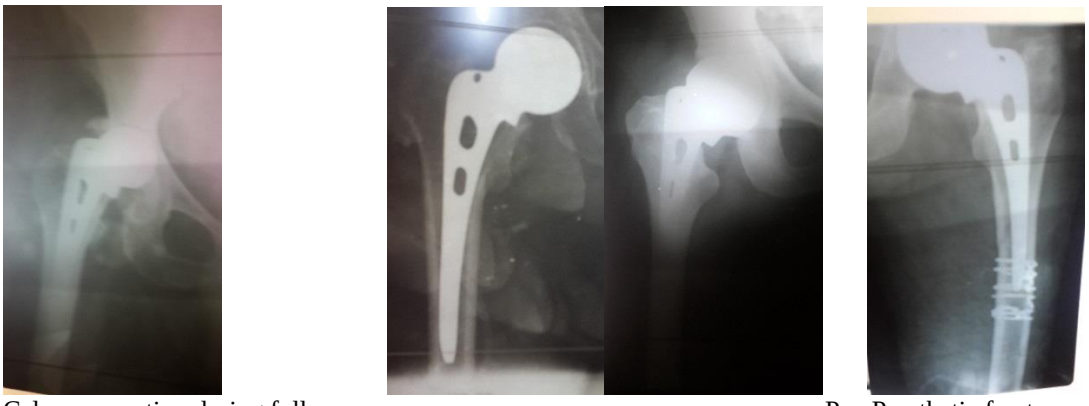
Out of 55 patients 40 male (72.72%) and 15 female (27.27%) the HHS at five year interval was excellent (B/W 80-100 points) in 43 patients (78.18), good (70 to 80 points) in 8 patients (14.54%) and poor (b/w 60 to 70 points) in four patients (7.27%); whereas HHS rating was dropped at the end of follow up period in which out of 48 patients 11 female (22.91%) and 37 male (77.68%) the score was excellent in 34 patient s (70-83%) good in 07 patients (14.58% and poor in 7 patients (14.58%). According to Charnley hip score assessment was also made with reference to pain, movement and walking ability with 0 to 6 point. And patients were graded excellent b/w 5 to 6 point, fair b/w 3 to 4 point and poor from 1 to 2 point and results were rated satisfactory if score rated b/w 4 to 6 and poor b/w 1 to 2 point. According to Charnley hip score scale at 5 years follow up, out of 23 patients 18 male (32.72%) and 5 female (9.90%) were having score b/w 5 to 6 point, out of 30 patients 22 male (48%) and 8 female (9.08%) were having 4 to 6 point and 2 patients (3.63%) both female were having 1 to 2 points. Overall satisfactory results were noted in 53 patients (96.53%) and poor results in 02 patients (3.63%) upto 5 years follow up. After 5 years till to end of follow up the overall satisfactory results were also dropped as in HHS assessment. The satisfactory result was (77.08%) instead of (96.53%) at the end of follow up. Poor or totally disabled persons were none as these patients either died or were lost to follow up.

As per radiological assessment we noted fracture of implant 0%, dislocation 1 patient(1.8%), Acetabulum Protrusia in 02 patients (3.36%), Osteolysis in 5 patients (9.09%), Calcar resorption 5 patients, loosening of implant 7 patients(12.72%), 1 patient had periprosthetive fracture femur 7 years after the surgery which was managed successfully with Circlage wiring. Many of the patients were having one or more than one above mentioned complication. The other complications noted during follow up were infection 5 patients (9.09%), pain 10 patients (18.18%), shortening with limp 3 patients (5.54%). Sciatic nerve injury with foot drop does not occur in any of the operated patients.

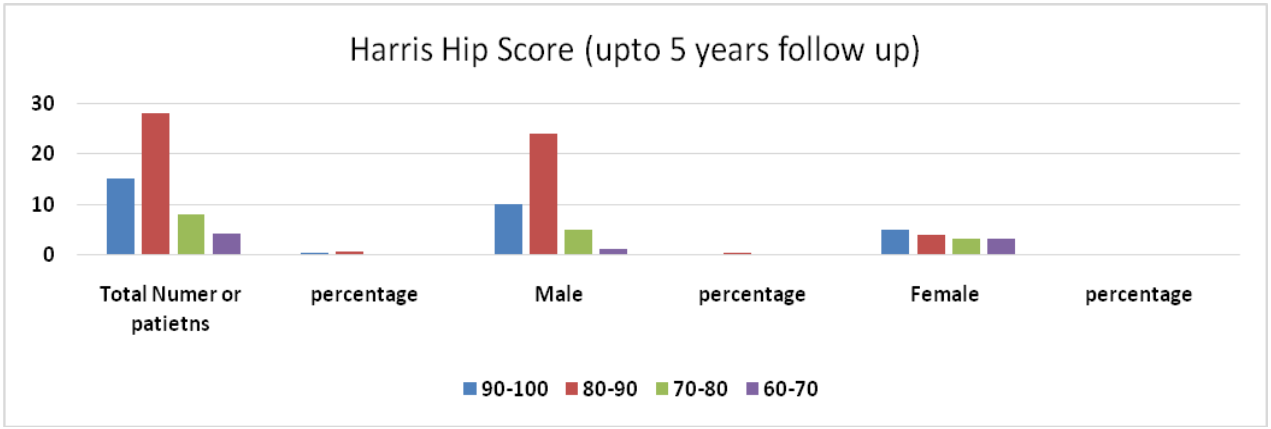
Fracture neck of femur different type

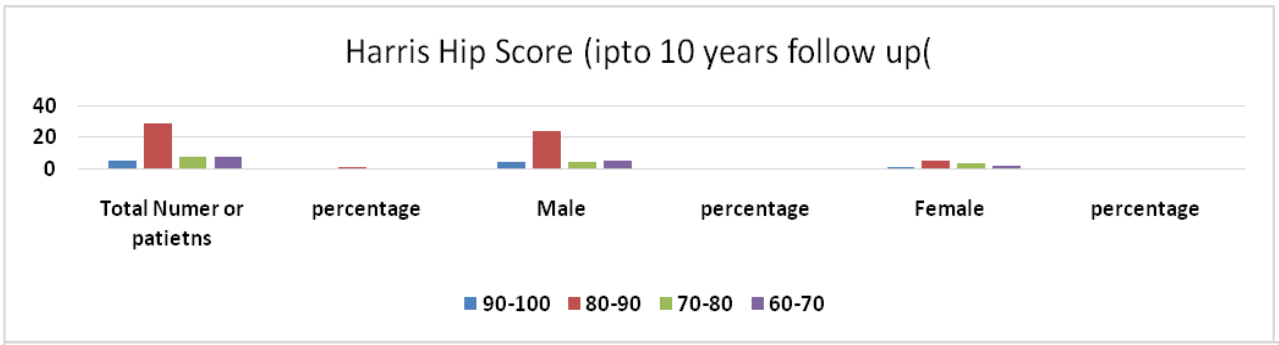


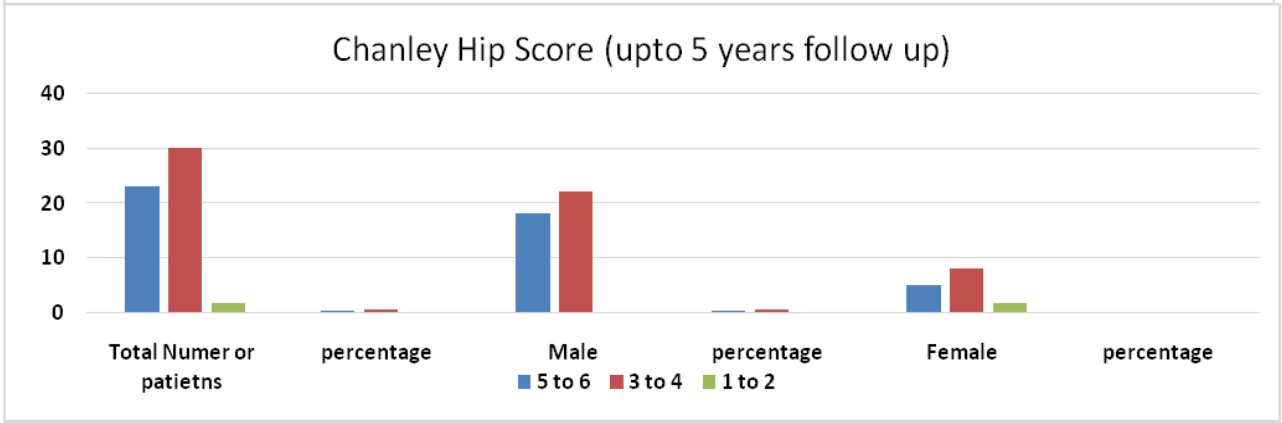
Fixation with A.M. Prosthesis fixation with A.M. Prosthesis

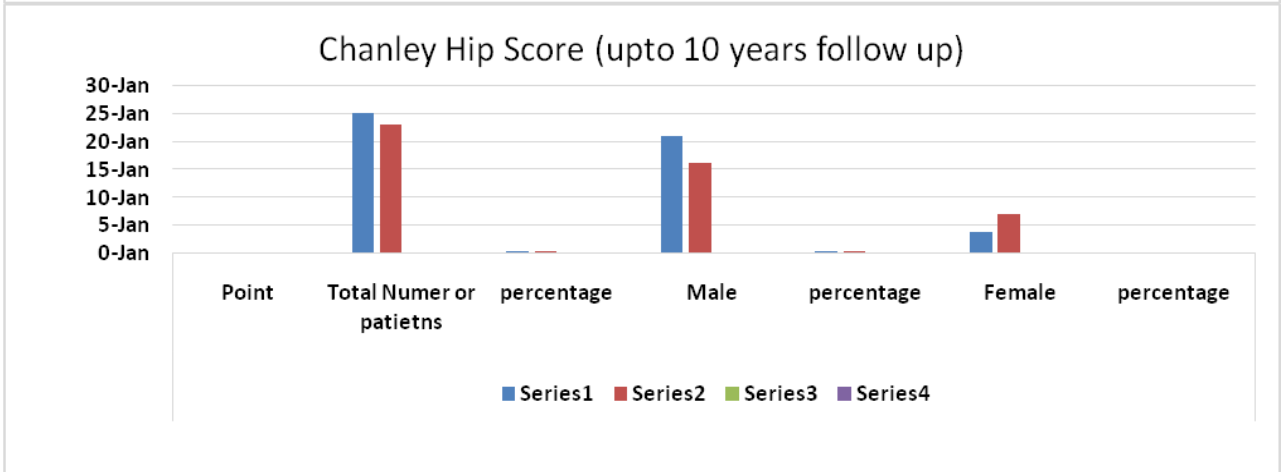


Calcar resorption during follow up Per-Prosthetic fracture


Harris Hip Score (upto 5 years follow up)
30
20
10
0
Total Numer or patietns
percentage
Male
percentage
Female
percentage
90-100
80-90
70-80
60-70


Harris Hip Score (ipto 10 years follow up(
40
20
0
Total Numer or patietns
percentage
Male
percentage
Female
percentage
90-100
80-90
70-80
60-70


Chanley Hip Score (upto 5 years follow up)
40
30
20
10
0
Total Numer or patietns
percentage
Male
percentage
Female
percentage
5 to 6
3 to 4
1 to 2


Chanley Hip Score (upto 10 years follow up)
30-Jan
25-Jan
20-Jan
15-Jan
10-Jan
5-Jan
0-Jan
Point
Total Numer or patietns
percentage
Male
percentage
Female
percentage
Series1
Series2
Series3
Series4

DISCUSSION

The management of besicervical fracture neck of femur has been challenging for an orthopedic surgeon since many decades. In the literature there is lot of discussion about its management which varies from internal fixation to hemiarthoplasty either unipolar or bipolar, cemented or uncemented to total hip replacement. The dreadful complications of reduction and internal fixation along with high rate of revision surgery has lead to increase in morbidity and mortality. This age group has drawn attention to hemiarthroplasty not only for fractures but different system comorbidities are responsible for mortalities.

Various studies have shown mortality rate o f15%, 23%, 26%, 38% in their series in elderly patients treated with A.M Prosthesis[1,3,5,17,18,19,20].

The frequency of femoral neck fracture is also increasing with increase in life expectancy and is predicted to be doubled in next 20 years and triple within 2050.

In the study of Jadhav A.P. et al, it was reported that the mean age is 65.7 years. Onceand Yinusa in his study and Essoh et ell reported age b/w 55 to 58 years with standard deviation of 7.2 years. In our study the mean age was 68 years.

Ahmed et al reported the ratio of male to female 1:2 in his series whereas in our study 72.72% were male and 27.27%.

Essoh et al have shown Gardon type-III 32.1% and type-IV 67.9% in his series whereas in our series out of 55 patients 30 patients (54.54%) were having type-III and 15 patients (27.27%) had Gardons type-IV fractures neck of the femur.

Many others have reported dislocation after Hemiarthroplasy in their series. Barnes C.L et al reported 1.5% dislocation rate in his series whereas other reported 4% dislocation rate. Tellisi and Wahab reported 3.4% dislocated rate in their series. Ahmed reported 4.3% dislocated rated in his series. We noted 1 dislocation (1.8%) in our study. We observed that maximum chance of dislocation is while shifting the patient from Operation Theater to ward, during X-Ray shifting and in irresponsible patients who do not follow post operative instructions. We always depute one medical officer during shifting and during post operative X-rays and were able to achieve good results.

The incidence of wound infection in developing countries is high which is the key source of post operative pain, loosening and erosion leading to different complications and increasing the mortality and morbidity. Apart from general measures this also depends upon duration of surgery and soft tissue handling. In our series we noted 5 patients (9.09%) with wound infection after one month to one year of surgery[20,22,27,28].

The incidence of Acetabular erosion increases with physical activities younger age group, post op infection and long duration of surgery. Baker R.P. reported 21 erosions, 66% in his series among 32 patients. In our series we noted that 7 patients (12.72%) had acetabular erosion during follow up where as acetabulum protusia was not noted in our series. We noted gradual reduction over 5 to 10 years post operatively in terms of Harris hip scale and Charnley hip scale but we observed that the deterioration was not only associated with surgery but was also due to gradual deterioration of health and involvement of other systems leading to reduction in activities. So we reached the conclusion that Hemiarthroplasty is safe and cost effective method in managing the patients in old age group. [4,6,7,14,17,20,22,23,27,28]

CONCLUSION

We reached to the conclusion that Hemiarthroplasty with Austin Moor prosthesis is safe and cost effective method with decreased mortality and morbidity; it gives 8 to 10 pain free years after surgery with negligible complications.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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