ORIGINAL ARTICLE

Story of the aged; Neck of femur fractures and their 5-year outcome after hemi-arthroplasty

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Abstract

Objective: To evaluate the outcome of hemi-arthroplasty of the hip in patients after neck of femur fractures.

Study design, setting and duration: Cross sectional study conducted at Patel Hospital Karachi on patients admitted for hip hemi-arthroplasty from January 2014 till June 2019.

Material and Methods: Patients were identified from hospital registration data base and basic parameters were recorded from medical records. Patients were then contacted via phone for follow up in clinic and Harris hip score was calculated.

Results: A total of 71-hpatients were identified from the record who underwent hip hemi-arthroplasty. Only 38% presented for follow up and had a mean Harris hip score of 82.59±10.89. Of the remaining patients, 42% were not able to present to clinic due to various reasons while rest of the individuals had suffered mortality.

Conclusion: Hip hemi-arthroplasty has stood the test of time and it is still the procedure of choice in elderly neck of femur fractures with optimal outcome.

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Introduction:

Fracture neck of femur is one of those skeletal injuries that an orthopedic surgeon has to deal almost every other day and is a major cause of morbidity and mortality worldwide.[1] It is estimated that by the year 2040, the population over 65 years of age will increase from 37.1 million to 77.2 million, thus increasing the number of fractures, with an estimated 6.3 million hip fractures worldwide by the year 2050.[2] Neck of femur (NOF) fractures have a bimodal distribution pattern with respect tothe age of the individuals. While in young patients the main goal of treatment is to preserve the head and its blood supply at any cost; in elderly patients with a low physiological reserve the aim is to mobilize the patient as early as possible and hence hip hemi-arthroplasty and total hip arthroplasty are the commonly performed procedures in this age group.

A variety of arthroplasty procedures have been defined in the literature for NOF fractures. Although total hip arthroplasty has gained a lot of popularity in treating these fractures,[3] hemi-arthroplasty implants are still standard practice including bipolar and unipolar implants both available in cemented and un-cemented designs. Although unipolar implants are falling out of favor gradually, cemented Thompson and the un-cemented Austin Moore hemi-arthroplasty prosthesis are still commonly implanted in our region of the world due to raised cost issues associated with a bipolar implant.[4] Moreover, the operative time with a unipolar implant is relatively short whereas morbidity and functional outcomes are comparable.[5]

In our study we have determined functional outcome of elderly NOF fracture patients who underwent hip hemi-arthroplasty.

Table 1: Basic characteristics of patients

Characteristic	Result (N=71)
Age (in years)	68.86 ± 9.28
Gender	
Male	31 (43.66%)
Female	40 (56.34%)
Side	
Left	44 (61.97%)
Right	27 (38.03%)
Hospital stay (days)	5.49 ± 2.46
ICU stay (days)	0.92 ± 0.33
Implant used	
Bipolar	56 (78.87%)
Thompson	06 (8.45%)
Austin Moore	09 (12.68%)
Diabetes	25 (35.21%)
Hypertension	41 (57.75%)
Ischemic heart disease	16 (22.86%)
Chronic Kidney disease	04 (5.63%)
Dead	14 (19.72%)
Follow up (months)	22.85 ± 14.7 (Range: 48 – 96)
Harris hip score	82.59 ± 10.89

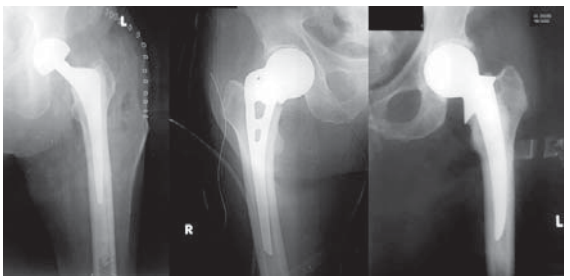

Figure 1: Post-operative X-rays of the three hemi-arthroplasty implants. Left: Cemented bipolar, Middle: Uncemented Austin Moore, Right: Cemented Thompson

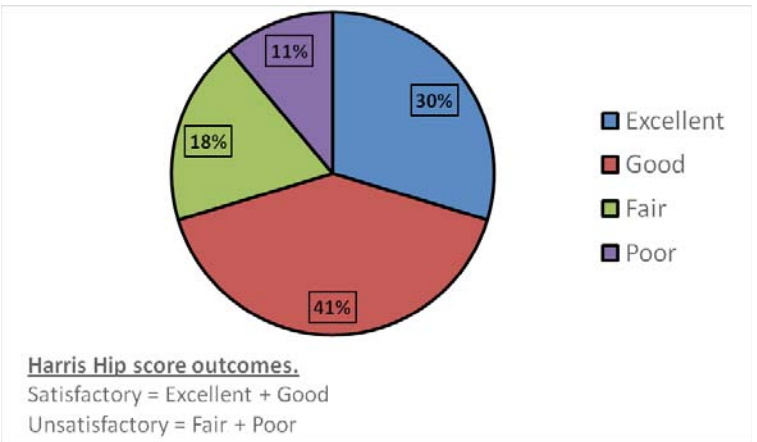

Figure 2: Graphical representation of outcome scores

Material and Methods:

This was a retrospective cross-sectional study conducted at Patel Hospital Karachi. All patients who underwent unipolar or bipolar hip hemi-arthroplasty for neck of femur fractures during January 2014 to June 2019 were included in the study. At our institution all hemi-arthroplasties are performed via Hardinge approach.[6] After approval from ethical committee the data was extracted from hospital record system. Basic chara cteristics such as age, gender, comorbidities, type of surgery (unipolar or bipolar), ICU stay and transfusion rate were recorded. Then patients were contacted via telephone for follow up visit in clinic for assessment and calculation of functional outcome using Harris hip score.[7]

Data was analyzed using SPSS version 19. Mean±standard deviation were computed for quantitative variables like age, hospital stay, transfusion, follow up and Harris hip score. Frequency and percentage were calculated for categorical variables like operated side, gender, and implant used.

Results:

During the specified time duration, a total of 71-patients with NOF fracture underwent hemiarthroplasty at our institution. Out of these, 40(56.34%) were female and 31(43.66%) were male. There was no mortality recorded in the same admission in any of the cases. Rest of the patient information is summarized in table – I.

Upon contacting, only 27-patients (38.02%) presented for follow up. Of the remaining cases; 14(19.71%) patients had died due to various causes, 8-patients (11.26%) were stationed out of city and were unable to present for follow up while rest of the 22-patients (30.98%) were not traceable on the phone numbers extracted from the records.

The mean Harris hip score was 82.59±10.89 of the 27-patients with a mean follow up of 22.85±14.7 months. There were no episodes of dislocations or peri-prosthetic fractures reported in these cases. Upon classifying the outcome,

8-patients had an excellent score, 11 had a good score while 5 and 3 patients had fair and poor outcomes respectively.

We were not able to demonstrate any relationship of the outcome scores to the presence or absence of comorbidities as the number of patients available for analysis was very small. Similarly, we failed to compare the outcome scores of different implants as we planned at the beginning of the study. However, it was evident from the data that there was a statistically significant relation of patients with chronic kidney disease suffering mortality (P value< 0.01).

Discussion:

While there is an increasing trend of performing total hip arthroplasty for elderly NOF fractures, still more than two thirds of this population receive hemi-arthroplasty whether cemented or un-cemented. Literature review tells us that total hip arthroplasty although has better 1-year survival, but is associated with more hip related complications.[8] At our institution, we reserve the option of total hip only for patients with pre-existent hip arthritis, or an elderly individual with a relatively higher functional demand.

While an un-cemented bipolar hemi-arthroplasty may be seem to be a more valid option when treating a NOF fracture patient with good bone quality, analysis of Norwegian hip fracture register data indicate that an un-cemented bipolar may have an increased risk of peri-prosthetic fractures, wound infection and hence higher re-operation rates.[9]

When comparing uni-polar implants to bi-polar types, Mishra AK et al described that uni-polar implants led to more early acetabular erosion than the bi-polar variety but both had comparable Harris hip scores.[4] An analysis performed on a large number of such patients report that bi-polar designs have lower incidence of hip pain and less re-operation rate.[5] A large meta-analysis also points out that the only statistically significant difference between these implants is that of less acetabular erosion associated with bi-polar type.[10] As reflected from our data, we also prefer bi-polar implant as it has wider size range and better modularity options and is relatively safer to perform. We reserve Austin Moore for the very infirm elderly patients to carry out a faster un-cemented procedure, while cemented Thompson for those with affordability issues (Figure – I). Shehata M.S.A and colleagues also concluded that results of Thompson are better when compared to Austin Moore with respect to reoperation rate and incidence of hip pain and intra-operative fractures.[11]

While historically described through a posterior approach and still performed in the same manner by many surgeons around the world;[12] Lateral and anterior approaches are now more popular for carrying out hemi-arthroplasties and total hip replacements with respect to better dislocation profile and lesser re-operation rates.[13]

Only 70% of our patients (Figure – II) had a satisfactory (i.e. good and excellent) outcome according to Harris hip scoring.[14] This may be due to the fact that a large number of our patients were lost in follow up. Secondly, the data includes both uni-polar and bi-polar outcome scores. Hence the results do not concur with other studies which demonstrate a 100 percent satisfactory Harris hip score.[15] When comparing bi-polar hemi-arthroplasties to total hip replacement in context of outcome scores, a recent studies demonstrates no significant difference between the two.[16]

Although patients with chronic kidney disease are known to suffer more complications and less favorable outcomes when compared to the general population,[17] in our study all patients with renal impairment had suffered mortality. The range of survival was 4 to 20 months in these patients. Therefore, one should be more vigilant when delivering peri-operative care to this subset of patients. While with worsening renal function there is obvious decline in bone quality, Tan TL et al found out that the rate of loosening of implant remains the same for both cemented and un-cemented types.[18] All patients with renal impairment undergo cemented implants at our center.

Conclusion:

For the treatment of fractures of NOF, hemiarthroplasty is still the treatment of choice in elderly low demand individuals. We prefer and a bipolar type over a unipolar whenever possible. Chronic kidney disease patients suffer a higher mortality and complication rates and hence need proper peri-operative care and detailed counselling.

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Role and contribution of authors:

Dr. Nasir Ahmed, collected the data, refererences and did the initial writeup.

Dr. Mahmood Askari, went through the article thoroughly and advised useful changes.

Dr. Adnan Ahmed, collected the data and helped in introduction writing.

Dr. Javed Ali, collected the data, references and helpd in discussion writing.

Dr. Mehroze Zamir, critically went through the article and made the final changes.

Dr. Syed Wajahat Kamal, collected the data, referenes and helped in discussion and result writing.

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