DISCUSSION

In the developing world, fracture neck of femur have always presented a great challenge to orthopaedic surgeons and even today remain the 'unsolved fracture' as far as treatment and results are concerned. With increasing life expectancy each decade, our society is becoming a geriatric society with significant number of hospitalized and nursing home patients suffering from femoral neck fracture and their sequalae.

Nonunion and avascular necrosis or late segmental collapses are principal complications of this fracture. The surgeon probably has less control over avascular necrosis than nonunion. All that surgeons can do is that early anatomic reduction, impaction of fracture and rigid internal fixation. Even after this much effort by the surgeons, there is no assurance that it will lead to an excellent result. Speed,[4] called the fracture neck of femur as "The unsolved fracture" and Barnes,[5] as "The unsolvable fracture". However, it has been agreed that whenever possible, the treatment should be such which allows early mobilization of patients. This saves the geriatric patients from complications like thromboembolic disease, decubitus ulcerations and pneumonias etc. Ideally one would like to fix the fracture so securely, that the individual could return to his pre-fracture state immediately. This goal is a formidable one because osteoporotic bone does not retain fixation well.

Dissatisfaction with the results of operative fixation of displaced fractures neck of femur resulted in widespread use of prosthetic replacement as primary treatment and numerous approaches to hip joint have been described each being claimed to have advantage over others.

The present study involves follow-up of 50 cases of intra-capsular fractures neck of femur treated by arthroplasty (THR or PHR 25 cases each) in the Department of Orthopaedics, Govt. Medical College and Rajindra Hospital, Patiala from

2009 to 2011. In this study 50 cases were followed-up after the operating surgeon has allocated them to either group depending upon the condition of acetabulum, pre-fracture mobility and morbidity as well as general condition of patient and results has been evaluated and compared with each other.

We have used Moore (southern) approach. Advantage of this approach is that it does not require osteotomy of greater trochanter and abduction function is not compromised. Disadvantage of this approach is that exposure of anterior aspect of acetabulum is difficult and post-operative dislocation is higher with this approach.

In our comparative study, in both groups maximum number cases about the extent of 56% has occurred in the 7th decade & minimum number of cases occurred in 9th decade. The mean age of patients was 70.64 years for PHR and 67.4 years for THR cases. The maximum number of cases occurred in age group of 61-70 years and these cases were matched in age, sex and type of fracture.

In this follow-up study for arthroplasty, PHR and THR were performed about 60% in females in the ratio of 0.4 : 0.6, but as per study of Hameed et al,[36] hip fracture is more common in geriatric females in ratio of 1: 4 as compared to males. So woman are more prone to hip fracture due to senile and post-menopausal osteoporosis due lack of estrogen hormone.[39]

As per Gebhard et al,[62] who studied about 166 patients for arthroplasty in fracture neck of femur and observed that the mean age of patients for THR was 75.2 years in comparison to 76.2 years in PHR. In his average long term follow up of about 56 months, they found that HA is recommended for active patients while THA for healthy active patients. However Taine & Armour (60) in their study of 163 patients found that mean age of patients was about 65 years and concluded that THA is good management for selected number of patients. But Sayaana et al,[35] has reported that there is an increasing evidence for THR is superior management for 65-80 years old

patients.

All cases of our study were classified as Garden's grade III / IV, which has occurred due to trivial trauma in both groups. The trivial trauma composed of about 92% in these senile osteoporotic patients which was as comparable to 90% that has reported by Alfram,[33] in his study.

In our follow up study of 50 cases, there were about 56% of cases with right side involvement for PHR as compared to 60 % involvement of left side in THR. The leg length discrepancy during this study has been reported in only 01 case i.e. 4% cases in PHR while it is reported in 02 i.e. 8% cases in THR. This case has been treated with shoe raise and during follow up no functional ambulatory difficulty was observed in these cases. In this study the average duration of unprotected weight bearing in PHR group was 3.3 weeks whereas in THR group it was 4.3 weeks. The late weight bearing in THR is due to weak musculature and other geriatric limitations like cognitive impairment.

During this study, the Salvati pain score of 0, i.e. unbearable and relieved with strong medication only was reported in 02 patients (8%) on 1st post-operative day in PHR as compared to 04 patients (16%) in THR group. During this follow-up on 90th post-operative day, none of the patients in PHR were having pain with activity, but only 02 patients (8%) having occasional pain and about 23 patients (92%) having no pain and started daily activities of life as compared to THR in which 03 patients (12%) were having pain with activity and 22 patients (88%) were having occasional and slight pain. During more than one and half year follow–up there was no significant difference in the both groups, as compared to difference found in earlier follow-up period. Although the partial weight bearing was started on 5th post-operative day, almost all cases were confined to bed up to 7th day in both groups. But, during further follow-up, up to 23 patients (92%) were partial dependent in PHR as compared to 24 patients

(96%) were partial dependent in THR, with one patient having dislocation being confined to bed up to 6 weeks. At 90th day 23 patients (92%) were having little restriction to activity / work in PHR as compared to THR group in which 18 patients (72%) were having limited house activity and only 7 cases (28%) were having limited restriction of activity. All the 25 patients (100%) were having full functional status in PHR as compared to 23 cases (92%) in THR at 180 days. But at end of study, there was no significant difference in functional status of patients, so a long term follow–up study is required to assess the functional status of patients.

During this study, in PHR at 60th day 20 patients (80%) were having good to normal power, flexion over 90 and good lateral & rotatory movements as compared to 18 cases (72%) in THR having fair to good power, flexion up to 90 with fair lateral and rotatory movements with one patient confined to bed due to dislocation. At 90th day, 23 cases (92%) in PHR were having motion status grade 8 as compared to 20 cases (80%) in THR. During further follow-up on 180th day all patients in PHR were having normal power and motion as compared to 23 cases (92%) in THR group. But at end of study, there was no significant difference in functional status of patients, so a long term follow–up study is required to assess the motion status of patients.

In this follow-up study, the average blood loss in bipolar cases was 85 ml (60-140 ml) as compared to 108 ml in THR cases and the average duration of operation in was 52 min (40-80 min) in PHR as compared to 74 min (40-90 min) in THR.

During this study, while comparing cost of surgery, the cost of THR and Bipolar is comparable about Rs 20500/- in terms of implant and medications, but there is prolonged hospital stay of 13.2 days in THR group as compared to 11.6 days in Bipolar cases.

In our follow–up study, a patient has been followed at an interval of one month for six months and there after six

monthly. All cases are reviewed on every visit, but none of patients has reported any kind of pain or loosening of implant at the end of follow-up. But there is documentation of aseptic loosening as high as about 18%-47% at various follow-up studies.[61] Meanwhile there are reports that pain and loosening are common in cemented arthroplasty which is as low as 2.2% for THR and 7.9% in cases of PHR.

All cases has been followed and evaluated for relief of pain, activity of daily life, functional status as well as restoration of movements at hip by Salvati Hip score,[77] at various intervals. In PHR maximum numbers of cases were followed up for 18-24 months and 02 cases left the study after followed up period of more than one and half year. Average period of follow-up is 21.4 months. All cases at one and half year follow-up have shown excellent results in pain, mobility, qualitative and quantitative function as well as daily activities of life. All cases of THR were followed at same intervals with maximum number of cases between 18-24 months and average duration of follow-up was 20.8 months. Only 03 cases left the study after one and half year follow-up period. At sametime of one and half year of follow-up, 02 i.e. 8% cases has shown good results and 23 i.e. 92% of cases has shown excellent results in pain, mobility, qualitative and quatitative function as well as daily activities of life. But Narayaan et al,[50] in his study of 61 patients which were followed for 24-90 months and documented that Harries Hip score was 83.82% for THR as comparable to 86.93% in bipolar cases. Sayaana et al,[35] in his follow-up study for displaced fracture neck of femur in age group of 65-80 years has shown that opinion regarding THR is divided, but there is increasing evidence that THR is superior in these elderly active ambulant patients. Taine and Armour,[60] in their follow-up study of 163 patients for THR, only 62% has shown excellent results that were assessed by Harry Hip score. Gebhard,[62] followed up 166 patients up to 56 months and documented that pain, walking and functional score was higher for THR than Hemi-arthroplasty, but reported that HA

is recommended for occasionally active patients in comparison to THR for healthy patients. However Ekulund,[65] in his study of 162 arthroplasty patients aged 80 years, 88% cases has shown excellent or good results and recommended that THR is safe in elderly people. Squires et al,[55] concluded that PHR is a good option for fracture neck of femur in elderly people with 66% of patients obtaining satisfactory results. Pain and mobility in patients who undergone PHR are inferior to THR in short term study of Parker.[69] Although some of patients had suffered urinary tract infection in both groups that were managed conservatively. Arthroplasty is associated with more independent living and was cost effective than any kind of internal fixation for fracture neck of femur and it provides satisfactory long term results.

During our follow-up period for PHR, no patient has undergone revision of surgery due to any kind of complications like aseptic loosening or deep wound infection. None of cases of THR has suffered morbid complications which had lead to revision of surgery, but Dorr et al,[61] has reported 18-47% re-operation rate in their study that may be due to acetabular erosion of hip or dislocation and Bakers,[53] in his study of 81 patients about age of 75 years, they reported revision of surgery in 02 cases in PHR and 03 case due to acetabular erosion. However Mabry et al,[72] has reported none of revision of surgery for his patients and documented 93% survival rate for all cases. So a long term follow-up is required to evaluate these results.

In our study, no mortality has occurred in the either group of patients for arthroplasty, because no patients has reported any deep infection or other morbid complications, which is very less as compared to 9% in the study of Gregary et al,[63] in the age group of 65-80 years. But Mishra et al,[71] has reported 6% mortality in his average 33 months follow-up study of 51 patients. Almost all cases of PHR has not suffered any kind of superficial or deep wound infection but in 01 case i.e. 4% cases of THR superficial wound infection has occurred, which

is very negligible as compared to as low as 1.2% in PHR,[69] and as high as 12.2% in THR.[65]

During this study, the stability of hip was also assessed in form of dislocation and found that none of patient in PHR has suffered dislocation as compared to THR in which only one patient has suffered traumatic dislocation, which has been reduced and in follow-up, no difference has been found in pain or ambulatory status in them and no morbid complications has been reported in them.

Pre-fracture morbidity is an often predictor of short term complications as well as long term mortality was found to correlate with pre-morbid ambulation as a facet of multi-factorial causation. As the opinion regarding arthroplasty in elderly people is divided and THR is indicated where life expectancy is significant. However PHR should be an ideal choice for individuals with co-morbidities and shorter life expectancy.

During our more than one and half year follow-up study, no case of PHR has undergone revision of surgery and none of THR has suffered from co-morbid complications. In this study of elderly people 92% of cases in THR has shown excellent results as compared to PHR which has shown 100% excellent results. At end of study, although there was no difference in pain, ambulation, functional status and movements in both groups, but in earlier period of follow-up, there was difference of pain, motion, and functional status of patients in PHR as compared to THR up to 180 days.

In these two groups, the difference was statistically non-significant (p value >0.05).

COMPARISON

Complications	PHR	THR
Average age	70.64	67.4
Sex ratio	0.4-0.6	0.4-0.6
Side involved	Right (56%)	Left (60%)
Trivial injury	92%	92%
Superficial wound infection	0	1
Deep wound infection	0	0
Dislocation	0	1
Mortality	0	0
UTI	2	2
Paralytic illeus	1	0
Limb length discrepancy	1	2
Vascular injury	0	0
DVT	0	0
Loosening of cup	0	0
Loosing of stem	0	0
Nerve injury	0	0
Cardiac complications	0	0
Femoral fracture	0	0
Average hospital stay	11.6 days	13.2 days
Unprotected weight bearing	3.3 weeks	4.3 weeks
Average follow- up period	21.4 mths	20.8 mths
Poor results at discharge	-	1(4%)
Fair results at discharge	17(68%)	9(36%)

Good results at discharge	8(32%)	12(48%)
Excellent results at discharge	-	03 (12%)
Excellent results at one and half year	25 (100%)	23(92%)
Good results at one and half year	-	02 (8%)