Management of fracture neck of femur in elderly patients with hemireplacement arthroplasty with austin moore prosthesis at tertiary care centre

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Abstract---Background: The incidence of fracture neck of femur in younger patients is very low and is associated mainly with high-energy trauma. The medical cost of these injuries, in the elderly age group, is higher compared to younger age group due to associated co-morbidities leading to an increased in-hospital stay and increased duration of post op care. Therefore, the present study has been taken up to evaluate the outcome of management of elderly geriatric individuals with Austin Moore prosthesis and the role of the prosthesis in present day orthopedic care in country in patients with multiple comorbidities and those who are home ambulant with limited activities at a large Orthopaedic centre. Materials & Methods: This is a descriptive study done on30 cases regarding intra-op complications and functional outcome in the elderly patients who have undergone hemiarthroplasty with Austin Moore prosthesis at Department of Orthopedics, Base Hospital Lucknow from July 2016 to Dec 2017 (18 months). Follow up of patients was done at 6 weeks, 12

weeks, 24 weeks and at one year following surgery and earlier in case of any complication. Functional Outcome was noted in terms of Modified Harris hip score at 6 weeks, 3 months and 6 months. The data was analyzed using Statistical Package for Social Sciences, version 21.0. Paired 't'- and Kruskal-Wallis test was used to compare the data. Results: The mean age of patients was 71.80+6.47 years. There was a female dominance (60%). Mean body mass index of study population was 23.35 ± 2.57 kg/m^2. Left side (66.7%) was more commonly affected as compared to right side (33.3%). Mean activity of daily life scores (Barthel index) showed a significant increase at different follow-ups. At 6 months mean Barthel index was 17.36+1.31. Functional outcome in terms of Harris hip score at 6 months was fair in majority (57.1%) of patients. There were 4 (14.3%) patients with good and 8 (28.5%) with poor outcome. At the final follow up at 12 months, one was able to walk without support, twelve were using stick only during long walks, twelve were using stick regularly for support and three were ambulant with walker. Conclusion: Austin Moore prosthesis should be reserved only for elderly debilitated patients who can withstand minimal operative duration, with limited life expectancy and are likely to remain home bound, for even in patients chosen with caution and inserted with skill the prosthesis may present with challenging complications during and after surgery.

Keywords---fracture neck femur, hemireplacement, arthroplasty, austin moore implant, functional outcome.

Introduction

Fracture neck of femur in elderly is a challenging entity to manage due to the presence of multiple comorbidities, poor general condition, prevalent osteoporosis in this group of population which is compounded by poor access to health care facilities, impaired physical function and inadequate home safety or supervision. The incidence of fracture neck of femur in younger patients is very low and is associated mainly with high-energy trauma. The majority occur in the elderly (average age of 72 years, Females affected more as compared to males)[1] as a result of low-energy falls and have significant implication on mortality, morbidity, hospital utilization and cost of health care of the community.[2]

The global burden of hip fractures was 1.7 million worldwide in 1990 which is estimated to increase to 6.3 million in 2050.[3] This increase is primarily due to increased life expectancy, improved access to health care facilities and an associated osteoporosis prevalent in the elderly age group particularly in emerging economies and it is expected that nearly half of these fracture will occur in India and China by 2050. A report estimated an annual incidence of 600,000 osteoporotic hip fractures in India in 2004, and this was expected to increase significantly by 2026, as the geriatric population increases to 12.4% of 1.36 billion population. The medical cost of these injuries, in the elderly age group, is higher compared to younger age group due to associated co-morbidities leading to an increased in-hospital stay and increased duration of post op care. With

growing elderly population, femoral neck fractures, as a consequence of osteoporosis, are becoming a real public health problem.

India being a country with illiterate population still constituting about one fourth of the total population, self-awareness of osteoporosis is poor. Moreover, non-availability of screening facilities at primary and secondary level of health centres also leads to higher incidence of osteoporosis and delay in start of treatment to help return the patient to his or her pre-morbid functional status with pain free joint. Unfortunately, elderly patients who sustain a hip fracture have a mortality rate at one year ranging from 14 percent to 36 percent with 50 percent of those who survive losing their ability to walk independently. The most important factors influencing mortality are cardiac risk factors, such as coronary artery disease, nursing home residences, chronic pulmonary disease, pneumonia, and duration of surgery.

Management of femoral neck fractures in elderly patients has been subject of discussion. Femoral neck fractures were considered 'untreatable fractures' in the early days of orthopedics[4] due to the high rate of associated complications, which include nonunion and avascular necrosis of the femoral head, among others. At present, there are multiple surgical modalities of treatment available which include cannulated screws, dynamic hip screw systems, blade plates, hemi and total hip arthroplasty.

Osteosynthesis for fracture neck of femur has been considered treatment modality in young individuals only due to high rates of failure of fracture fixation and prolonged restricted activity needed in the post op period to allow the fracture to heal. Intracapsular extent of the fracture, tenacious blood supply to the femoral head going through the neck and difficulty in maintaining fracture reduction and hold of the implant due to osteoporosis have been cited as reasons for failure of fixation. On the other hand, elderly patients need early mobilization with weight bearing as these patients are generally medically compromised due to age and associated co morbidities.

Thus, fracture neck of femur in elderly patients is commonly managed using prosthetic replacement, which allows immediate weight bearing to return elderly patients to activity and help avoid complications of recumbency and inactivity. When the concept of prosthetic replacement was first introduced, this perhaps was the most important advantage. A myriad of options of prostheses for treatment of fracture neck of femur are available at present varying from unipolar prosthesis, fixed bipolar prostheses, modular bipolar prostheses to total hip arthroplasty with cemented or cementless options. The choice of implant is governed by various factors including age, patients' general condition, co morbidities, activity level and socioeconomic status.

Austin-Moore prosthesis has been one of the most commonly used unipolar prosthesis for hemiarthroplasty for displaced fractures of the neck of femur in adults since its inception. In 1940, Austin Moore inserted the first vitallium prosthesis to replace the proximal femur, this was developed to a straight-stemmed prosthesis in 1950.[6] There are many case reports of these actually

lasting a long time (>20 years) however the profile of the patient varies as these patients had good bone stock to support the prosthesis.

In unipolar prosthesis it is the head size which dictates the size of stem for the femur. The lack of modularity with associated potential of poor femoral fixation, acetabular erosion and increased incidence of thigh pain are the most common reasons which lead to poorer outcome in elderly patients particularly in the hands of young surgeons but the procedure is still more common because of less cost of the prosthesis.[7] It has been suggested that trainee surgeon must be taught that cutting of the femoral neck and seating the collar of the prosthesis on the calcar are the important technical aspects of this operation.[8]

The newer Hydroxyapatite coated proximal press-fit prostheses have come up which offer the advantage of modularity which helps to reproduce biomechanics close to prefracture status with added advantage of shorter duration of surgery, no risk of bone cement implantation syndrome, better osseo-integration and lesser amount of blood loss leading to lower requirement of blood transfusion with the benefits of early ambulation and return to pretrauma ambulatory status for the patient. Therefore, the present study has been taken up to evaluate the outcome of management of elderly geriatric individuals with Austin Moore prosthesis and the role of the prosthesis in present day orthopedic care in country in patients with multiple comorbidities and those who are home ambulant with limited activities at a large Orthopaedic centre.

Materials & Methods

This is a descriptive study done on30 cases regarding intra-op complications and functional outcome in the elderly patients who have undergone hemiarthroplasty with Austin Moore prosthesis at Department of Orthopedics, Base Hospital Lucknow from July 2016 to Dec 2017 (18 months).

Inclusion Criteria

- Cases of fracture neck femur of age group above 65 years.
- Medically fit for surgery even with any other comorbidities.
- All types of fractures under Gardens Classification.

Exclusion Criteria

- Seriously ill patients & Pts not fit for surgery.
- Fracture due to tumour or any other pathological cause.
- Compound Fractures
- Other limb fractures and diseases
- Neurovascular injuries
- Severe dementia

Methods

The patients were evaluated and followed up according to protocol. Patients were informed about the surgical procedure and consent was taken. All cases were done under regional anaesthesia with patient in lateral position on the operating table with affected side facing up. Hardinges approach or posterior approach were used depending upon the surgeon's preference. The capsule was incised, and fractured head and neck were delivered out the acetabulum was cleared of debris. The head size was measured using the femoral head gauge. Femoral neck if long was cut keeping 2-2.5 cm calcar above lesser trochanter. The femoral canal was found and prepared for insertion of prosthesis. An appropriately sized Austin Moore's prosthesis based on femoral head size was inserted in the canal with 10-15 degree of anteversion, adequate seating of prosthesis on calcar was visualized directly. The prosthesis was reduced using gentle traction, capsule sutured, and wound closed.

Patient was mobilized on 1st POD with walker support. Follow up of patients was done at 6 weeks, 12 weeks, 24 weeks and at one year following surgery and earlier in case of any complication. Patients who did not turn up in the OPD were followed up using telephonic conversations including subjective assessment in terms of quality of life. Functional Outcome was noted in terms of Modified Harris hip score at 6 weeks, 3 months and 6 months. The final modified Harris Hip scores were multiplied by 1.1 in order to make them comparable to Harris hip score at a scale of 100 and the outcome at 6 months was interpreted by as follows[9]: 1. Score <70 (Poor), Score 70-79 (Fair), Score 80-89 (Good) and Score 90-100 (Excellent).

Data Analysis

Data so obtained was fed into computer using Microsoft Excel software. The data was analyzed using Statistical Package for Social Sciences, version 21.0. Paired 't'- and Kruskal-Wallis test was used to compare the data. The confidence level of the study was kept at 95%, hence a 'p' value less than 0.05 indicated a statistically significant association.

Results

Our study showed that majority of patients (56.7%) was 65 and 70 years of age group. Mean age of patients was 71.80+6.47 years. Mean height, weight and body mass index of patients was 160.4±8.36 cm, 60.97±10.33 kg and 23.35±2.57 kg/m^2 respectively. Gender ratio of study population was 0.67 (table 1). Among different comorbidities, hypertension (n=12; 40%) was most common followed by anemia and diabetes (20% each). Three (10%) patients had CVA with hemiparesis and 2 (6.7%) each had COPD, immune surveillance and previous history of fracture femur of opposite side. There were 17 (56.7%) patients with multiple comorbidities. Majority of patients had involvement of left side (66.7%). Right side was involved in 10 (33.3%) cases.

The changes of mean value of VAS score between was 1.47+0.51 at 6 weeks to 3 months, between 3 and 6 months was a VAS decline of 1.28+0.76 and between 6

and 12 months the mean decline was 1.07+0.60. At all the follow-up intervals, the change from previous follow up was significant statistically (p<0.001). Overall mean change in VAS from 6 weeks to 12 months was 3.82+0.86. Statistically, this change was significant (p<0.001) (table 3). Mean Barthel index values, indicating independence in activities of daily life, were 12.50+1.35, 14.64+0.91 and 17.36+1.39 respectively at 6 weeks, 3 months and 6 months intervals respectively, thus showing an increase of 2.14+0.97 between 6 weeks and 3 months and 2.18+0.91 between 3 months and 6 months. During both the periods, change from previous visit was significant statistically (p<0.001) (figure 1).

Mean Harris hip score was 36.36+4.73 at 6 weeks, 52.21+7.19 at 3 months and 65.68+7.16 at 6 months. Between 6 weeks and 3 months and between 3 and 6 months, Harris hip score showed an increase of 15.86+6.05 and 13.47+5.25 respectively. At both the intervals, the change from previous interval was significant (table 4). In present study, majority of the patients (n=16; 57.1%) achieved fair functional outcome, 8 (28.5%) achieved poor outcome and 4 (14.3%) achieved good outcome. None of the patients achieved excellent outcome (table 5). Complete follow up was done in 28 cases. Preoperatively, 20 were able to ambulate without support, 7 with stick and 1 used walker. On comparing the data from pre-operative status, at all the follow –up intervals, the difference was significant statistically (figure 2).

In 3 (10%) cases prosthesis was failed in two cases dislocation of prosthesis took place before first follow up while in 1 case owing to continuous pain, revision surgery (THR) had to be performed. There was one mortality; however, it was unrelated with the surgical procedure (table 6).

Discussion

Fracture neck of femur in elderly patients was common fractures routinely managed by hemiarthroplasty using Austin Moore prosthesis. The Austin Moore prosthesis was developed in the 1950s and there have been significant advances in the hip prosthesis design in the following decades. Austin Moore prosthesis is cementless monopolar prosthesis with non porous coated collared perforated stem. It is an old monopolar prosthetic design which has its own problems in intra and postoperative management by hemiarthroplasty. However, it still remains one of the most common used prosthesis in developing countries due to its easy availability, cheap cost and a presumably easy surgery in the hands of an experienced surgeon.

The role of Austin Moore prosthesis as the right implant for hemiarthroplasty in today's scenario is questionable. Austin moore prosthesis is a monobloc uncemented prosthesis with non porus coated stem with fenestrations in the stem and fixed vertical and horizontal offsets. These features pose unique challenges both intra and post operatively in carrying out the safe surgery and avoiding post operative symptoms of thigh pain and early loosening due to osteoporosis. There is paucity of adequate evidence base in Indian literature to categorically say that Austin Moore prosthesis still has role in modern day orthopaedics management of fracture necks of femur in elderly. Moreover, there

has been insufficient evidence to favour routine use of costly modular prosthesis.[10]

The most common reasons to use the Austin Moore prosthesis other than the cost factor remain amongst others shorter operating time decreasing the blood loss and surgeons concern about cement related complications and mortality.[10] All of these patients were either home ambulant or were community ambulant. The age of patients ranged from 65 to 85 years with a mean age of 71.80+6.47 years. Majority of patients in present study were females (60%). Most of the studies show a dominance of females which can be linked to high prevalence of osteoporosis among elderly women and hence susceptibility to fractures, particularly proximal femur fractures.[11-16] As far as age profile is concerned, the mean age reported by different studies ranges from 69.7 years[17] to as high as 83.7 years[12]. Mean age of patients in present study is close to that reported by Daniel *et al.*[13] and Deo *et al.*[18] who reported the mean age as 69.7 and 70.5 years in their studies. Difference in mean age of patients in different studies might be attributable to the inclusion criteria chosen by them and definition of elderly taken in different studies. For example Shekhar *et al.*[12] in their study included all the patients above 70 years of age, however, Daniel *et al.*[13] and Deo *et al.*[18] included patients aged 60 years of above in their study. In present study though, we included the patients who were aged 65 years or more, however, the mean age was comparable to the studies that took 60 years or above as the criteria for inclusion. The reason for this was the dominance of patients in 65-70 years age group (56.7%). In fact, in present study, patients older than 75 years comprised only 26.7% of total study population. Compared to this Keren *et al.*[19] had found 48% of their patients in age group >85 years while in present study none of the patients were above 85 years of age.

In present study, general built and nourishment of the patients was found to be moderately better despite their older age as could be reflected from their body mass index. The present study had patients having body mass index in 18.36 to 27.12 kg/m^2 with mean body mass index of 23.35±2.57 kg/m^2. There was only one patient with body mass index <18.5 kg/m^2 (*i.e.* underweight category). The better general health status of the patients in present study could be attributable to the fact that the present study was carried out at a services hospital that caters primarily to armed forces personnel and their dependents. On evaluating the literature, none of the studies reviewed by us has reported the results in context with body mass index. However, a general perception is that old age patients, particularly those with comorbidities and home-ambulant profile have poor generalized health which is not reflected as per body mass index of patients in present study.

All the patients included in present study had unilateral fracture and left side was more commonly involved as compared to right side. In unilateral involvement cases, the side of involvement is a chance finding with different studies showing involvement of different sides. Vishwanath and Mummigatti[20] in their study showed involvement of right side in majority of their cases while Panchal *et al.*[21] similar to our study found involvement of left side in majority of their cases.

Presence of comorbidities is a common finding in elderly patients, particularly that of lifestyle disorders like diabetes and hypertension. Daniel *et al.*[13] in their study, reported presence of one or more comorbidities in 42.9% of patients. In their study too, hypertension alone (28.6%) and hypertension with diabetes (11.4%) were the most common comorbidities. Keren *et al.*[19] in their study also reported comorbidities in majority of patients in their study (52%). Dawadi *et al.*[15] too in their study reported comorbid conditions in 66.7% of patients with 33% patients showing presence of more than one comorbidity. Panchal *et al.*[21] in their study showed comorbid conditions in all the patients with diabetes (45.45%) and hypertension (27.27%) being the most common comorbidities.

In present study, Austin Moore Prosthesis head size ranged from 41 to 53 mm with a mean of 46.67+3.53 mm. Majority required Austin Moore Prosthesis of 41-45 mm size. Compared to present study, Panchal *et al.*[21] in their study reported head size in 39 mm to 43 mm range, however majority of patients in their study too required Austin Moore Prosthesis in 41-45 mm range. One of the limitations of Austin Moore Prosthesis is the fact that it a mono bloc prosthesis which is inserted by press fit. The size of prosthesis is dictated by the femoral head size only and there is no option to vary the size of stem according to the canal diameter. Thus the variation which a surgeon would expect in the biomechanical axis and offset of the hip joint according to the varying skeletal profile as can be deduced from the varying body mass index of the patients are not replicated due to its mono-bloc design limitation.

Final follow up in present study could thus be restricted to 28 patients only. The patients were assessed at stipulated intervals on the basis of their assessment of pain, ambulatory status and dependency for activities of daily living using VAS score, modified Harris hip score and Barthel index. In present study, mean pain VAS scores showed a gradual and significant decline with the passage of time. At final follow up mean pain score was 2.61+0.92 on a scale of 10. Pain in unipolar hemiarthroplasty has commonly been attributed to acetabular erosion, calcar resorption, osteolysis leading to loosening of prosthesis or medial thigh pain associated with impingement of the stem on to the femur during seating of the implant[.8] . In present study, though most of the patients reported decrease in pain over the period of observation, few patients continued to complain of pain on ambulation which required use of analgesics which significantly affected and resulted in poor end results in their modified hip score. This pain was even present in absence of any radiological abnormality in these patients. One of the patients continued to be symptomatic with pain and sense of instability and was taken up for revision surgery (Uncemented THR). However, overall, there was a significant decline in pain scores with each follow-up interval. At final follow-up mean pain score was reflective of only nominal pain (2.61±0.92). Observations similar to this effect were also reported by Vishwanath and Mummigatti[20] who also reported mild to slight occasional pain in 60% of their cases while 40% patients had complete resolution of pain. Deo *et al.*[18] too in their study reported complete resolution of pain in 67% of patients in their study. The findings in general support that Austin Moore Prosthesis related pain seems to subside over time and by final follow-up only nominal pain is reported. In present study, the experience of patients was recorded in context of pain while ambulation, however, none of the patients were symptomatic with pain at rest.

In present study, with subsequent follow-up intervals a significant improvement in Barthel's index was observed. By the end of study (6 months' follow up), the Barthel's index was 17.36±1.31 out of a maximum possible of 20, thus showing that the patients were able to perform their activities of daily life with minimal help of attendant. In their study that had a follow up of 12 months, Figved et al[22] reported achievement of Barthel's index 19 or 20 in 44% of their cases at 3 months and 49% of their cases at 12 months. Though the present study did not follow the patients upto that extent, however, the mean Barthel indices at final follow up were reflective of achievement of similar outcomes.

The detailed functional outcome was evaluated using Modified Harris Hip score. Harris hip score is one of the most commonly used outcome indicators for evaluation of functional outcome among patients undergoing fracture neck prosthesis. During the course of study, a steady increase in Harris Hip scores showed a continuous adaptability and increased functional ability of the patients. On final follow up at six months, Harris hip scores showed that majority of the patients (n=16; 57.1%) achieved fair functional outcome, 8 (28.5%) achieved poor outcome and 4 (14.3%) achieved good outcome. None of the patients achieved excellent outcome. High inconsistency in outcome of Austin Moore Prosthesis in different studies, while some studies[11,15,20] show good to excellent results obtained in majority of cases in their series, however, some series mentioned just the opposite results with majority patients showing fair/poor results.[13] There could be many reasons for difference in outcomes in different studies. There is variation in duration of follow up in different studies as well as in the age profile of the patients. Moreover, patient might have had different functional demands and perceptions depending upon their needs and activity profile. In present study, despite being in elderly age group, most of our patients were ambulant and had higher functional demands, thus perceiving the functional status in an altogether different context and thereby reporting poor on Harris Hip score despite scoring well with respect to daily activity outcome as measured by Barthel's index and progressive decrease in pain.

These findings thus suggest that elderly age, or presence of multiple comorbidities even in patients who are home ambulant cannot be considered as sole criteria for use of Austin Moore prosthesis. As far as complications are concerned, none of the patients had limb length discrepancy >1 cm. Limb length discrepancy is one of the most common complications associated with Austin Moore Prosthesis, owing to the fact that the prosthesis has fixed femoral offsets due to its mono bloc design. Naiya et al.[23] reported limb length shortening in 20% of patients receiving Austin Moore Prosthesis in their study. Panchal et al.[21] in their study reported shortening as an early postoperative complication in 9.1% of patients in their study. These studies in general indicate that limb length discrepancy is one of the commonly observed phenomenon with Austin Moore Prosthesis.

In the present study, there were no periprosthetic fractures, however in two patients the prosthesis was found to be loose during surgery and hence were converted to cemented bipolar hemiarthroplasty (not included in study). There could be a number of reasons for failure, i.e. periprosthetic failure, implant breakage, calcar resorption, acetabular protrusion, instability, improper positioning of Austin Moore prosthesis and painful hip for no obvious cause.[24]

According to Lunceford[25], improper placement of the prosthesis and the resulting biomechanical disturbances within the hip joint (excessive elongation or shortening of the extremity or improper rotation of the implant) are responsible for failure of hemiarthroplasty. Inadequate calcar seating, insufficient residual femoral neck length, insufficient metaphyseal fill, and errors in sizing the prosthesis are all associated with early failure of the Austin Moore hemiarthroplasty[26]. We received a patient of fracture neck of femur managed elsewhere using uncemented Austin Moore prosthesis with severe pain in her hip making her bedridden. The radiological evaluation showed complete resorption of articular cartilage on the acetabular surface which was cause of severe pain. She was managed with prosthesis removal and conversion to cemented Total hip arthroplasty.

Today's evidence available in Indian literature of use of Austin Moore prosthesis in elderly patients with fracture neck of femur are few and none of these studies have included patients managed by inexperienced surgeons. Uncemented hemiarthroplasty with Austin Moore prosthesis is a technically demanding procedure especially in the elderly with poor musculature and osteoporosis and has been frequently associated with intraoperative implantation errors when done in the hands of inexperienced surgeons. Obtaining satisfactory clinical results depends upon correct and reproducible surgical skills as technical errors of implantation have been associated with poor outcome and early failure. Adequate pre-operative planning, Careful patient selection, proper training of surgeons as well as attention to detail is vital and may minimize intraoperative technical errors with Austin Moore prosthesis.[27]

Many studies comparing unipolar with bipolar prosthesis have favoured bipolar prosthesis for reducing stress on the acetabular surface and better reproduction of biomechanical axis and offset**Error! Bookmark not defined.**. In another set of studies comparing THR with unipolar and bipolar hemiarthroplaties, THR was adjudged to be a better procedure for patients older than 75 years who have normal mental state and high functional demand. They recommended hemiarthroplasty (unipolar and bipolar) only in patients with limited life expectancy and minimal functional demands.[28] The Austin Moore prosthesis has been compared with uncemented HA coated implants and has been reported to have inferior results.[29] The survivor ship of the prosthesis has also been adjudged to be lower when compared with cemented hemiarthroplasties.[25] The prosthesis is also more prone to rotatory instability as there is no option to adjust the femoral stem size according to femoral canal diameter and the stem is also non porous coated surface finish, providing less surface friction and no option for bone in growth.

Conclusion

The findings of present study thus showed that in our settings, Austin Moore Prosthesis, despite having a high success rate (90.0%) did not show promising functional outcome within the limited follow-up period. Thus, we recommend that the choice of prosthesis in case of fracture neck of femur be individualized and not be based upon the age or related profile of the patient. Austin Moore prosthesis should be reserved only for elderly debilitated patients who can

withstand minimal operative duration, with limited life expectancy and are likely to remain home bound, for even in patients chosen with caution and inserted with skill the prosthesis may present with challenging complications during and after surgery.

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Table 1: Age, Gender and Anthropometric Profile of Patients (n=30)

SN	Variable	No. of cases	Percentage
Age			
1.	65-70 years	17	56.7
2.	71-75 years	5	16.7
3.	76-80 years	3	10.0
4.	81-85 years	5	16.7
Mean Age±SD (Range) in years		71.80+6.47 (65-85)	
Gender			
1.	Males	12	40.0
2.	Female	18	60.0
Gender ratio (M:F)		0.67	
Anthropometric Profile			
Mean height±SD (Range) in cm		160.4±8.36 (148-174)	
Mean weight±SD (Range) in kg		60.97±10.33 (45-85)	
Mean BMI±SD (Range) in kg/m^2		23.35±2.57 (18.36-27.12)	

Table 2: Side involved and Comorbidity Profile

SN	Variable	No. of cases	Percentage
Side Involved			
1.	Left	20	66.7
2.	Right	10	33.3
Comorbidity Profile*			
1.	No comorbidity	8	26.7
2.	Anemia	6	20.0
3.	Hypertension	12	40.0
4.	COPD	2	6.7
5.	CVA with hemiparesis	3	10.0
6.	Diabetes	6	20.0
7.	Immune surveillance	2	6.7
8.	Previous h/o fracture femur of other side	2	6.7

*Some patients had multiple comorbidities

Table 3: Visual Analogue Score (VAS) assessment for pain at different follow-up intervals [Scale range 0(no pain) to 10 (most severe pain)] (n=28)

SN	Time interval	Mean VAS Score	SD	Change from previous visit		Significance of change from previous visit (Paired 't'-test)	
				Mean change	SD	't'	'p'

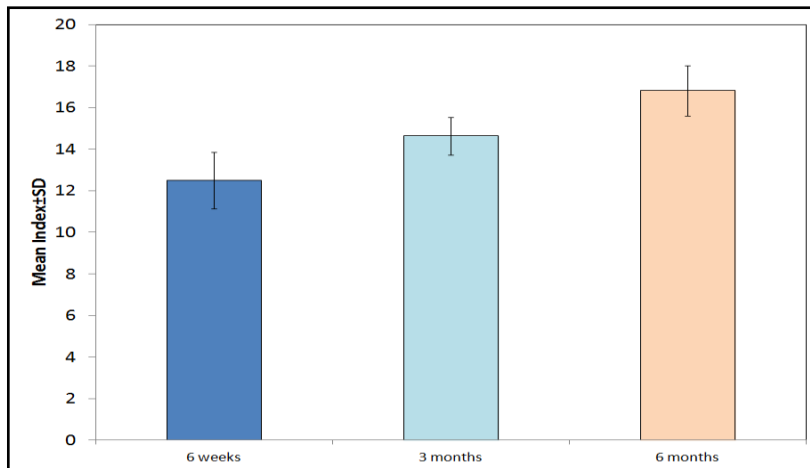|							
1.	6 weeks	6.43	0.74				
2.	3 months	4.96	0.69	-1.47	0.51	15.26	<0.001
3.	6 months	3.68	0.95	-1.28	0.76	8.92	<0.001
4.	12 months	2.61	0.92	-1.07	0.60	9.38	<0.001
Overall change from 6 weeks to 12 months				-3.82	0.86	23.43	<0.001

Fig. 1: Activities of Daily Life assessment (Barthel Index) at different follow-up intervals

Table 4: Functional Outcome (Harris Hip Score) at different follow-up intervals [Scale range 0 to 91] (n=28)

SN	Time interval	Mean Harris Hip Score	SD	Change from previous visit		Significance of change from previous visit (Paired 't'-test)	
				Mean change	SD	't'	'p'
1.	6 weeks	36.36	4.73				
2.	3 months	52.21	7.19	15.86	6.05	13.88	<0.001
3.	6 months	65.68	7.16	13.47	5.25	13.58	<0.001

Table 5: Functional Status at 6 months follow up (Based on 100-point Harris Hip Score) (n=28)

SN	Status	No. of cases	Percentage
1.	Poor	8	28.5
2.	Fair	16	57.1
3.	Good	4	14.3

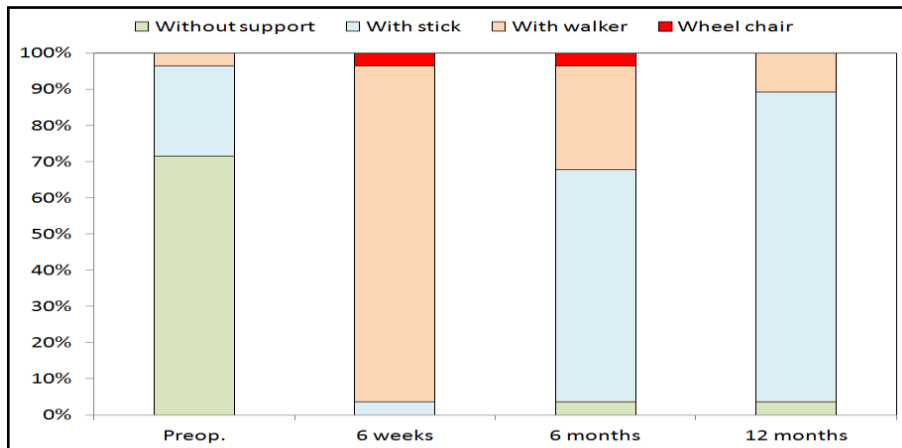| 4.	Excellent	0	0

Fig. 2: Ambulatory Status at baseline and different follow up intervals

Table 6: Complications, limb length discrepancy, morbidity, mortality and revision need (n=30)

SN	Status	No. of cases	Percentage
1.	Prosthesis Failure	3	10.0
2.	Mortality	1	3.3
3.	Revision surgery	1	3.3