

Functional Outcome of Total Hip Replacement in Elderly Patients with Fracture Neck of Femur in a Tertiary Care Hospital**Harish Ugrappa¹, Roshan Iqbal², Naveen Ramanaik Hoysala³, Bharathkrishna S⁴, Mruthyunjaya T D⁵**^{1,2,3,4}Assistant Professor, Department of Orthopedics, Sri Siddhartha Institute of Medical Sciences & Research Centre (SSIMRC), T Begur, Nelamangala Taluk, Bangalore Rural Dist – 562123⁵Professor and HOD, Department of Orthopedics, Sri Siddhartha Institute of Medical Sciences & Research Centre (SSIMRC), T Begur, Nelamangala Taluk, Bangalore Rural Dist – 562123

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Abstract:**Background:** Femoral neck fractures, the most common injury in the elderly and presents great challenges to orthopedic surgeons. The number of elderly people is on the rise, the burden of this fracture and its sequel is challenging. Evaluation of long-term outcomes of an operative procedure is important to determine the durability of the procedures like total hip replacement (THR). This study was done to assess the functional outcome of cemented total hip arthroplasty in elderly patients with fractured neck of femur at 2 to 4 years follow up.**Methods:** A prospective follow up study for 5 years was conducted among elderly patients with fractured neck of femur who were treated with cemented total hip arthroplasty. By convenient sampling method 32 cases of fracture were analyzed for functional outcome by using Harris Hip Score post operatively and followed them for 2-4 years.**Results:** Majority 29 (90.6%) of the people had excellent and good functional outcome and only 2 (6.3%) had poor functional outcome in our study. The total HHS score was statistically better for the mid-term follow up compared to short term follow up ($p < 0.001$)**Conclusion:** The cemented Total hip arthroplasty (THA) is a very useful procedure for the primary treatment of femoral neck fractures in elderly. This procedure markedly improves the functional status of the patient in terms of early mobilization, avoiding the complications of prolonged immobilization. Longer follow up studies are recommended to assess the hip function, implant survival and complication related to wear and loosening in the long term.**Keywords:** Cemented THA, Fracture Neck of Femur, Functional Outcome, HHS.

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Introduction

Femoral neck fractures, one of the most common injuries in the elderly, have always presented great challenges to orthopaedic surgeons. The incidences of these fractures are expected to double in the next twenty years and triple by the year 2050. [1] The prevalence of the fracture also doubles for each decade of life after the fifth decade [2]. With our society becoming more and more a geriatric society, the burden of this fracture and its sequel continues to be on the rise [3].

The goal of treatment of femoral neck fractures is restoration of pre-fracture function without associated morbidity [4]. At present Total hip replacement arthroplasty is the most performed adult re-constructive hip procedure and has relieved millions of people from incapacitating pain arising from hip joint [5]. The success of Total Hip Replacement arthroplasty is its ability to relieve the

pain associated with hip joint pathology, while maintaining the mobility and stability of the hip joint [5]. With the superiority of prosthetic replacement over internal fixation in elderly being well established, primary Total Hip Replacement (THR) is being offered at many centers as a treatment option for these fractures.

Evaluation of long-term outcomes of an operative procedure is important to determine the durability of the procedures like total hip replacement (THR). Patient derived outcome scales have become increasingly important to surgeons and clinical researchers for measuring improvement in function after surgery. The Harris hip score is the most widely used scoring system for evaluating hip arthroplasty [6]. This study was done to assess the midterm functional outcome of cemented total hip arthroplasty in elderly patients with fracture neck of

femur in a tertiary care hospital at 2 to 4 years follow up and to compare the short term (1year) and mid-term (2-4yrs) functional outcome of cemented total hip arthroplasty in fracture neck of femur in elderly.

Methodology:

Study Design: Prospective follow up Study

Study Setting: Department of Orthopedics at Dr. R.N. Cooper Municipal General Hospital, Juhu, Mumbai.

Study Duration: 5 years (April 2015- March 2020)

Study Population: Elderly patients with fractured neck of femur who were treated with cemented total hip arthroplasty.

Inclusion criteria: Elderly patients aged 65 years and above with post traumatic fracture neck of femur type 3 and 4 Garden's Classification. The Pre-fall ambulatory status of at least household ambulation with closed fractures. Patients operated from April 2015 to March 2016.

Exclusion Criteria: Patients with pathological fracture neck of femur or compound fracture. Patients with fracture neck of femur associated with other perhip fracture dislocation like intertrochanteric, subtrochanteric, acetabular fractures, hip dislocations. Patients with active infection of the hip or anywhere systemically and bedridden patients. Previously operated replacement surgery of same side. Pre Fall non ambulatory due to comorbidities like paralyzed limb, muscular weakness, generalized weakness.

Sample Size: A total of forty cases were selected for the study in the study period after satisfying inclusion and exclusion criteria and they were followed up for 6 months to 4 years. At the end of 2 years following surgery 2 patients died due to medical reasons and 6 patients lost for follow up. The functional assessment was therefore analyzed

for the remaining 32 patients. The final sample size was 32.

Sampling Method: Convenient Sampling Method

Ethical Clearance: The ethical clearance was taken from the Institutional Ethics committee.

Data Collection Method: Once the patient was willing to participate in the study, all the essential information was recorded in the proforma prepared for this study. They were observed regularly during their hospital stay till they got discharged. They were asked to come for follow up regularly to the outpatient department. Those who did not come were contacted via phone. The follow up summary was recorded in the follow up chart of the proforma. Preoperative, operative data and follow-up data were collected, and functional assessment was done using Harris Hip Score. X-rays of pelvic with bilateral Hip AP view were taken for radiological assessment. Modified Harris Hip Scoring System has maximum points of 100 for 4 functional components (Pain relief- 44 points, Function – 47 points, Range of Motion –5, Absence of deformity – 4). The scores were classified as Excellent (90-100), Good (80-89), Fair (70-79) and Poor (Less than 70). [7]

Data Entry and Analysis: The data was entered into Microsoft excel sheet and was analyzed using EpiInfo. The data was analyzed using frequencies, percentages, mean and standard deviation. Chi-square test was used to compare the qualitative variables, paired t test was used to compare the qualitative variables and a p value of less than 0.05 was considered statistically significant.

Results

A total of 32 patients were included in our study and 13 (40.6%) were males and 19 (59.4%) were females with a mean age of 68.2± 3.4 years.

Table 1: Basic Demographic and Clinical Details of the participants

Characteristics	Frequency	Percentage
Gender		
• Male	13	40.6
• Female	19	59.4
Age Group		
• 65-70 years	28	87.5
• 70-80 years	4	12.5
Occupation		
• Skilled	13	40.6
• Unskilled	19	59.4
Side of Fracture		
• Right	15	46.9
• Left	17	53.1

Mode of Injury		
• Self-fall	24	75.0
• Road Traffic Accident	08	25.0
Type of Fracture		
• TC	28	87.5
• SC	04	12.5
Type of Garden Classification fracture		
• Type 3	16	50.0
• Type 4	16	50.0
Co-morbidities		
• Hypertension	07	21.9
• Diabetes Mellitus	05	15.6
• Both Diabetes Mellitus and Hypertension	03	09.4
• No Co-morbidities	17	53.1

About 28 (87.5%) participants were in the age group of 65-70 years and 19 (59.4%) had unskilled occupation. Among the study population 17 (53.1%) had Left side of hip fracture, 24 (75%) had history of self-fall, 28 (87.5%) had TC type of fracture and equal number Garden classification fracture of type 3 and type 4 were present. Around 53% of the study

participants did not have any co-morbidities (Table 1). Majority 29 (90.6%) of the people had excellent and good functional outcomes and only 2 (6.3%) had poor functional outcome in our study. Only one patient had deep infection complication and 5 (15.6%) had dislocation as complication (Table 2).

Table 2: Functional Outcome and Complications of the participants after surgery

Characteristics	Frequency	Percentage
Functional Outcome based on Harris Hip Score		
• Excellent	26	81.2
• Good	03	09.4
• Fair	01	03.1
• Poor	02	06.3
Complications		
• No Complications	26	81.3
• Deep Infection	01	03.1
• Dislocation	05	15.6

Table 3: Comparison of Harris Hip Score for Short Term (1 year) and Midterm (2-4 Years) Follow Up

Harris Hip Score for Short term (1 Year) and Midterm (2-4 Years) Follow up	Mean \pm SD	P value
Pain Score		
• Short Term (1 Year)	40.31 \pm 3.84	<0.0001
• Mid Term (2-4 Years)	42.44 \pm 4.18	
Function Score		
• Short Term (1 Year)	42.00 \pm 4.98	<0.0001
• Mid Term (2-4 Years)	43.56 \pm 5.25	
Total Score		
• Short Term (1 Year)	90.09 \pm 8.39	<0.0001
• Mid Term (2-4 Years)	93.78 \pm 9.38	

The HHS mean score for pain and function were better at mid-term follow up compared to short term follow up and it was statistically significant also. The total HHS score was also better for the mid-term follow up compared to short term follow up and found to be statistically very significant in our study.(Table 3)

Discussion

The optimal treatment for displaced fracture neck of femur in elderly patients is a matter of controversy [8]. Surgical treatment options include hemiarthroplasty and total hip arthroplasty. The goals of any treatment methods for fractures of femoral neck are to return the patients as quickly as possible to a satisfactory functional status with minimal morbidity and mortality, minimizing the need for re-operation. Debate about the comparative benefits of hemiarthroplasty and total hip arthroplasty for acute displaced femoral neck fracture has been on-going [9]. Coates and Armour had reported a mortality of 29%, 7% were known to have died in the first month mainly due to medical complications like ischemic heart disease, pulmonary embolism and septicemia complicating wound infection. [10] In the later studies mortality reported was significantly reduced. Delamater and Moreland 12% at one year. Gebhart et al report a zero percent in hospital mortality. [11,12] In our study, 4 patients had died due to medical complications. Mortality rate of 10% at the end of 2 yrs was noticed. This has been attributable to advances in anaesthesia and critical care medicine and improvement in medical facilities. Rogmark C et al reported duration of hospital stay of 12days (5-44), Mouzopoulos G Et al reported 8.3 days, Vanden Bekerom MP et al reported 18.4 days (4 – 86). [13-15] In our study, the average duration of hospital stay was 29.9 days (9-69days). This delay was unavoidable as many patients had associated medical condition which required evaluation and stabilization before surgery. In older patients, stability of secondary conditions (cardiac, renal, pulmonary) must take precedence over treatment of a femoral neck fracture, so that mortality can be decreased.

Mouzopoulos G et al, reported mean HHS at 1year 81.6±4.9 and at 4yrs 83.7± 4.8. Vanden Bekerom MP et al, reported mean HHS at 1 year 76 and at 4yrs 75.2. There is significant improvement in HHS at midterm. Mean HHS at short term (1yr) was 90.09 ± 8.4 and midterm (2-4yrs) was 93.8± 9.4. In our study, functional assessment was done using Harris hip score (HHS). Vanden Bekerom MP et al reported mean HHS pain at 1 yr was 40 and at 5yrs was 40.1, mean HHS function at 1 yr was 20.8 and at 5 yrs 20.1, Mouzopoulos G et al reported mean HHS function at 1yr 84.8±14.8 and at 4yrs 85.3±11.6.

In our study, mean HHS pain at 1 yr was 40.3±3.9 and at 2-4 yrs was 42.4±4.2. Mean HHS function at 1 yr was 42.4±5.0 and at 2-4yrs was 43.6±5.2. There was a significant improvement in pain and function at midterm with total hip replacement. Squires B et al rated 86% as good or excellent. In our study according to the Harris hip score 29 (90.6%) patients had good to excellent results, 1(3%) fair and 2(6%) poor outcome was noted. [16] Dislocation of prosthesis has been the major concern after a primary total hip replacement. [17,18] A higher rate of dislocation was reported previously in total hip replacement [19,20]. In patients using a posterolateral approach during surgery reported incidence of dislocation ranged between 13% to 22% [20,21].

Morrey et al reported much higher dislocation rate for posterior approach (5.8%) that of anterolateral approach (2.3%) which is one of the reasons preventing orthopaedic surgeons worldwide to go for a primary THA in this fracture. [22] Rogmark C et al reported 8(4.2%) dislocation. [13] Vanden Bekerom MP et al reported 8 (6.9%) dislocation. [15] In our study there was 5(15.6%) dislocation rate, 4 recurrent dislocation with was reduced by administering general anesthesia, one patient had chronic dislocation, we could not operate upon due to lack of willingness of the patient for second surgery. The Patient started walking on dislocated hip, there was a pseudo acetabulum formation at the end of 1 yr. Major objection worldwide for doing primary total hip arthroplasty in fracture neck of the femur is a high rate of dislocation.

With good surgical technique and experience, the dislocation rate can be reduced. Rogmark C et al reported 1(0.5%) deep infection. In our study, there was one (3.1%) patient who had a deep infection. Repeated debridement was done. Sinus tracks healed with no active discharge with repeated debridement and antibiotic administration. This suggested that prophylactic antibiotic significantly reduced the rate of sepsis in conventional operation theatre. [13]

A major objection worldwide for doing primary total hip arthroplasty in fracture neck of the femur is a high rate of dislocation. With good surgical technique and experience, the above complication is avoidable. Total hip arthroplasty has a good result in the long term with improvement in pain and function and cemented THR is cost effective. Therefore, we consider primary THA to be a viable option for treatment in a selected group of previously independently mobile that is older than their physiological age.

Limitation of the study: Loss to follow up: Because of long follow up period and multiple follow up many eligible candidates who underwent surgery could not attend all the follow ups.

Conclusion

The cemented Total hip arthroplasty (THA) is a very useful procedure for the primary treatment of femoral neck fractures in elderly. This procedure markedly improves the functional status of the patient in terms of early mobilization, avoiding the complications of prolonged immobilization. Longer follow up studies are recommended to assess the hip function, implant survival and complication related to wear and loosening in the long term.

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