Quest Journals
Journal of Medical and Dental Science Research
Volume 10~ Issue 3 (2023) pp: 01-08
ISSN(Online) : 2394-076X ISSN (Print):2394-0751
www.questjournals.org

Research Paper

Functional Outcome of Total Hip Replacement in Fracture Neck of Femur

Dr. L. Sai shashank [1], Dr. A. Prabhakaran [2],Dr. Vishnu harikrishnan [3]
Mahatma Gandhi Medical College and Research Institute, Pondicherry, India.

ABSTRACT:
Background: *Fracture neck of femur is common in elderly patients following trivial fall. Various methods of treatment are available for the fracture, however Arthroplasty gives better functional outcome and allows early mobilization of the patient, immediate weight bearing, less pain, less revision rate and finally earliest society participation to all patients.*
Aim: *The aim of our study was to evaluate functional outcome of total hip replacement in fracture neck of femur.*
Patients and Methods: *In this prospective interventional study, we enrolled 25 patients after satisfying the inclusion and exclusion criteria. Harris Hip Score was assessed postoperatively at 6, 12 and 24 weeks and postoperatively prosthesis position is observed and analyzed radiologically.*
Results: *The Harris hip score increased in all intervals from 6, 12, 24 weeks followup and was statistically significant (p value<0.001). Out of 25 patients 20 patients had excellent outcome , 4patients had good outcome and 1 patient had poor outcome. Out of 25 patients 23 patietnts had acetabular inclination was between 30 ^{0} to 50^0 (Mean = 42.6 ± 4.43), 1 patient had < 30 ^{0} and 1 patient > 50 ^{0}. Horizontal COR was equal to opposite side in all 25 patients and vertical COR was equal to opposite side in 22 patients. Femoral stem was found to be neutral in 22 patients, 2 patients had varus and 1 patient had valgus. In 23 patients anteversion was between 5^0-25^0 (Mean = 14.6 ± 5.24), 2 patients had anteversion < 5^0. In 1 patient limb length discrepancy of >1 cm was seen.*
Conclusion:
By our study total hip replacement for neck of femur fractures provided encouraging results. Adhering to proper surgical technique and maintaining post opeartive radiological parameters plays a crucial role in functional outcome. Hence we recommmend total hip replacement as method in treating neck of femur fractures.
Keywords*: Harris hip score, Acetabular inclination, Center of rotation, Femoral stem positioning, Acetabular anteversion.*

Received 20 Feb., 2023; Revised 01 Mar., 2023; Accepted 03 Mar., 2023 © The author(s) 2023.
Published with open access at www.questjournals.org

I. INTRODUCTION:

Femur neck fracture is referred to as an unresolved fracture. Despite various advancements there is still no simple system of care that can consistently treat this fracture successfully. For any orthopaedic surgeon, managing this fracture is a rigorous and difficult undertaking[1]. Many of these fractures are unstable. Because of its peculiar bloodsupply a neck of femur fracture may cause circulatory disturbance leading leading to vascular necrosis and non-union. So every fracture neck of femur should be treated as emergency[2]. Total hip replacement is a surgical procedure, which has relieved debilitating pain that originates from hip joint [3].

II. METHODOLOGY:

This prospective interventional study conducted in Mahatma Gandhi Medical College and Research Institutein Pondicherry between March 2021– April2022 included25 patients who underwent Total Hip Arthroplasty for neck of femur fractures. All the patients were selected for the study based on the inclusion and exclusion criteria.

Non salvegeable neck of femur fractures (Nonunion, Avascular necrosis, Displaced femoral neck fractures in elderly, failed Osteosynthesis) were included in the study.Patients withseptic foci, medically unfit

patients, neuromuscular disorders, skin diseases at the surgical site were excluded in the study.

Patients were assembled into a single group. Supine X-ray of pelvis with both hips Ap View was taken for all patients. An informed and written consent was obtained from the patient. After getting the anaesthesia fitness, the patients were posted for Total Hip Replacement surgery. Post operatively X-ray pelvis with both hips AP view and X-ray hip lateral view were taken.Functional outcome of the patients was assessed using Harris Hip Score 6, 12, 24 weeks. Post operatively the prosthesis position was observed and analyzed radiologically.

III. RESULTS:

The mean age of the patients involved in the study was 60.12 years. Among the 25 patients involved in the study 14 patients were females and 11 patients weremales. 15 patients underwent cemented and 10 patients underwent uncemented total hip replacement.

TABLE1: DISTRIBUTIONOF AGE

AGE	FREQUENCY	PERCENT
<40	1	4.0%
40-60	9	36.0%
>60	15	60.0%
Total	25	100.0%

TABLE2:GENDERDISTRIBUTION

GENDER	FREQUENCY	PERCENT
FEMALE	11	44.0%
MALE	14	56.0%
Total	25	100.0%

TABLE3:CEMENTED/UNCEMENTED TOTAL HIP REPLACEMENT

CEMENTED/UNCEMENTED THR	FREQUENCY	PERCENT
CEMENTED THR	15	60.0%
UNCEMENTED THR	10	40.0%
Total	25	100.0%

TABLE 4: HARRIS HIP SCORE

	MEAN	**MEDIAN**	**STANDARD DEVIATION**
HHS 6 WEEKS	81.6	84.3	9.24
HHS 12 WEEKS	87.5	89.4	7.11
HHS 24 WEEKS	91.4	92.6	7.01

TABLE 5: INTERPRETATION OF HARRIS HIP SCORE

HARRIS HIP SCORE	**6WEEKS**	**12 WEEKS**	**24 WEEKS**	**FINAL PERCENTAGE AT 24 WEEKS**
EXCELLENT	2	13	20	80%
GOOD	17	10	4	16%
FAIR	3	1	0	0%
POOR	3	1	1	4%

TABLE 6: ACETABULAR INCLINATION

ACETABULAR INCLINATION	6 WEEKS	12 WEEKS	24 WEEKS
LESS THAN 30^0	1	1	1
30^0- 50 ^{0}	23	23	23
MORE THAN 50^0	1	1	1

TABLE 7: VERTICAL CENTER OF ROTATION

Vertical Centre of Rotation	6 weeks	12 weeks	24 weeks
Increase	3	3	3
Equal	21	21	21
Decrease	1	1	1

TABLE 8: HORIZONTAL CENTER OF ROTATION

Vertical Centre of Rotation	6 weeks	12 weeks	24 weeks
Increase	0	0	0
Equal	25	25	25
Decrease	0	0	0

TABLE 9: FEMORAL STEM POSITIONING

Femoral stem positioning	6 weeks	12 weeks	24 weeks
Neutral	22	22	22
Valgus	1	1	1
Varus	2	2	2

TABLE 10: LEG LENGTH

LEG LENGTH	6 weeks	12 weeks	24 weeks
<1 cm	24	24	24
>1 cm	1	1	1

TABLE 11: ACETABULAR ANTEVERSION

Acetabular Anteversion	6 weeks	12 weeks	24weeks
Less than 5º	2	2	2
5º-25º	23	23	23

CASE ILLUSTRATION:

Fig 1: Pre-op X-ray

Fig 2: Immediate Post-op X-ray

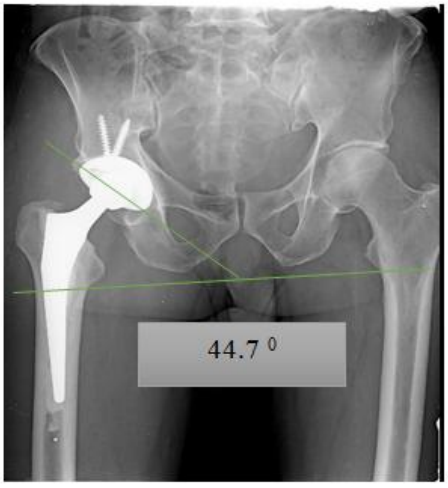

Fig 3: Acetabular inclination : 44.7 ^{0}

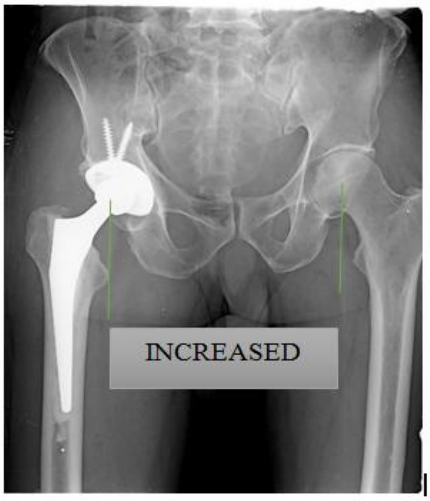

Fig 4: Vertical Center of rotation : Increased

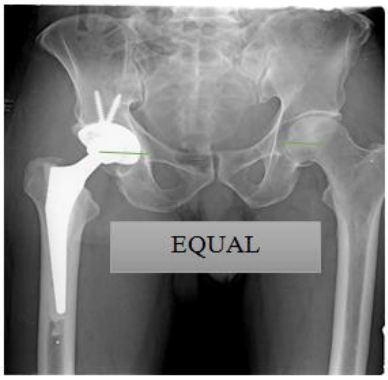

Fig 5: Horizontal Center of rotation : Equal

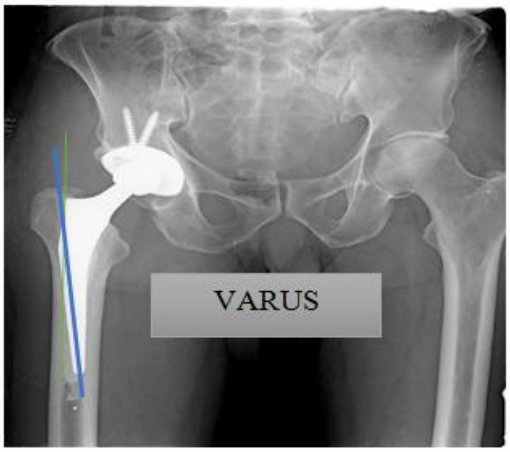

Fig 6: Femoral stem positioning: Varus

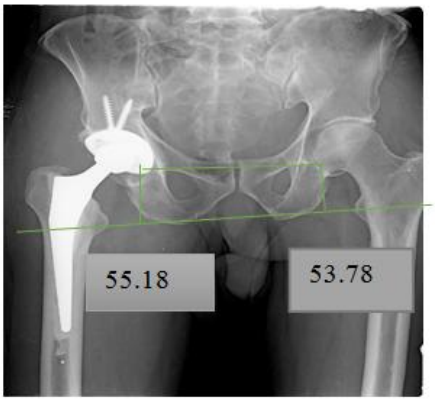

Fig 7: Leg Length: 1.40 MM

FLEXION

EXTENSION

ADDUCTION

ABDUCTION

IV. DISCUSSION:

Total hip arthroplasty continues to evolve. This surgical procedure thatwas once for elderly patients is now being performed in all age groups, also patients with high activity level. As the number of patients requiring hip arthroplasty continues to rise, this effectivesurgicalprocedure needs to meet challenges of the future[4].

AGE:
The Mean age of the patients in present study was 60 years with aRange (35-79). Kannan et al [5] reported Mean age to 63.8 years.

SEX:
In our study 56% patients were male and 44% patients were female.In similar study done by Rohit Amar et al [6] 71.67 % were male and 28.33 % were female.

SIDE:
Out of 25 patients, 13 cases were left hip while 12 cases were righthip operated. In a similar study done by Rohit Amar et al[6] out of 120patients 73 cases were right hip and 47 cases were left hip operated.

CEMENTED/UNCEMENTED:
In our study, 15 cases underwent cemented THR and 10 cases underwent uncemented THR. According to Rohit Amar et al [6]67 cases underwent cemented THR and 53 cases underwent uncemented THR.

HARRIS HIP SCORE:

In our study Mean Harris Hip Score (HHS) at 6 weeks followup wasfound to be 81.6 ± 9.24, which increased to 87.5 ± 7.11 at 12 weeks and 91.4 ± 7.01 at 24 weeks and it shows that harris hip score improves significantly in the subsequent followups. ($p<0.001$).

In our study at the end of 24 weeks, 20 patients had excellent outcome, 4 patients had good outcome and 1 patient had poor outcome.

Our findings were comparable with Kannan et al [5] which had excellent outcome in 84% patients and good outcome in 12% patients and 1% patients had fair outcome. Rohit amar et al[6] reported 54.17 % patients had excellent, 26.67 % patients had good and 8.33 % patients had fair and 10.83% patients had poor outcome. In our study out of 25 patients 23 had acetabular inclination between 30^0 and 50^0 (Mean= 42.6 ± 4.43). 1 Patient had acetabular inclination above 50^0 and 1 patient had below 30^0.

The normal range of inclination is between 30^0 and 50^{07}. In similar study done by Rohit Amar et al [6] out of 120 patients 94 patients had acetabular inclination between 30^0 to 45^0 and 14 patients had > 45^0 and 12 patients had < 30^0 acetabular inclination.

In our study out of 25 patients 23 patients had neutral stem positioning and 1 patient had varus and 1 patient had valgus stem positioning. In a similar study done by Rohit amar et al [6] out of 120 patients 92 patients had neutral and 17 patient had valgus and 11 patients had varus stem positioning.

In our study out of 25 patients in 22 patients the vertical center of rotation is equal to the non-operated side. In 2 patients it is increased and in 1 patient it is decreased compared to the non-operated side. In our study All 25 patients had horizontal centre of rotation equal to the Non-operated side.

In our study 22 patients had Limb length discrepancy < 1cm (1cm=10mm) and 3 patients had LLD >1 cm. In a study done by Bansal et al [8] reported that more than 1 cm limb length discrepancy was seen in 25 patients with overall mean discrepancy of 0.24 cm (Range 0 to 3 cm). Patil P et al [9] reported that 2 patients had 1 cm lengthening and 1 Patient had 1.5cm limb lengthening. In our study discrepancy of limb length was managed by providing compensatory shoe raise on affected or unaffected side. Thus, inference can be drawn that patients undergoing the procedure canhave limb length discrepancy,which can be kept to minimum with appropriate measures.

In our study 23 patients had acetabular anteversion ranging 5^0 - 25^0 (Mean=14.6 ± 5.24). Normal value ranges from 5° to 25° anteversion as this allows adequate flexion of the hip. 2 patients had acetabular anteversion less than 5^0. In a study done by Olav reikeras et a[10] the mean acetabular anteversion was reported to be 13.9 ± 10.1.

COMPLICATIONS

In present study only 1 patient (4%) had complication of anterior thigh pain. The patient with complaint of anterior thigh pain was managed conservatively with NSAID'S. Rohit amar et al [6] reported that varus position of the stem may lead to complications such as anterior thigh pain.

LIMITATIONS

- Smaller sample size
- Need long term follow up

V. CONCLUSION

By our study total hip replacement for neck of femur fractures provided encouraging results. Adhering to proper surgical technique and maintaining post opeartive radiological parameters plays a crucial role in functional outcome. Hence we recommmend total hip replacement as method in treating neck of femur fractures.

REFERENCES

[1]. Dickson, J.A. The "unresolved" fracture: A protest against defeatism. JBone Joint Surg35 (A) : 805,1953.
[2]. Baski D.P. Internal fixation of ununited femoral neck fractures combined with muscle pedicle bone grafting JBJS. 68 B : 239-245, 1986.
[3]. Harkess, J. W. "Arthroplasty of the hip". Campbell's Operative Orthopaedics Mosby, 1998.
[4]. Lettich T, Tierney M G, Parvizi J, Sharkey P F, Rothman R H. Primary Total Hip Arthroplasty with an uncemented Femoral Component: Two- to- Seven -Year Results. The Journal of Arthroplasty.2007;22(7):43-46.
[5]. Dr.Kannan, Dr.Umashankar, Analysis of Functional outcome of Total Hip Arthroplasty in Fracture Neck of Femur in elderly patients in our Institution, International Journal of Scientific research :Volume 7 / Issue -4 / April -2018.
[6]. Dr. Rohit Amar, Dr. G.N Khare, Dr. Rupesh Jung Belbase, Dr.Yogesh Kumar. " Total hip arthroplasty in displaced neck of femur fracture: A radiological outcome assessment ". European Journal of Molecular & Clinical Medicine, 7, 7, 2021 , 4854-4860.
[7]. Vanrusselt J, Vansevenant M, Vanderschueren G, Vanhoenacker F. Postoperative radiograph of the hip arthroplasty: what the radiologist should know. Insights Imaging. 2015 Dec;6(6):591-600.
[8]. Bansal A, Singh R, Zuber M, Gaur S. A study to evaluate functional outcome of uncemented primary total hip arthroplasty operated at our center. Orthop J MPC 2019:25(1):8-11.
[9]. Patil P, Reddy GE, Kumar R M, Ravishankar J. A prospective study to valuate the clinical and functional outcome of uncemented total hip arthroplasty in avascular necrosis of femoral head in adults. National journal of clinical orthopaedics 2019;3(2): 10-16.
[10]. Reikeras O, Gunderson RB. Cross table lateral radiography for measurement of acetabular cup version. Ann Transl Med.2016;4(9):169.