



Outcome Analysis of Uncemented Primary Total Hip Replacement Done for Fracture Neck of Femur Through Direct Lateral Approach in Government Vellore Medical College & Hospital in the Time Period of Jan 2014 to July 2016

Dr. V. P. Mohan Gandhi

M.S Ortho, Professor and Head of the Department of Orthopedics, Govt. Vellore Medical College, Adukkamparai, Vellore, Tamil Nadu, India. PIN- 632011

Dr. R. Samuel Gnanam

M.S.Ortho, Associate Professor of Orthopedics, Govt. Vellore Medical College, Adukkamparai, Vellore, Tamil Nadu, India. PIN- 632011

Dr. S. K. Saravanan

M. S. Ortho, Senior Resident/ Assistant Professor in Orthopedics, Govt. Vellore Medical College, Adukkamparai, Vellore, Tamil Nadu, India. PIN- 632011

ABSTRACT

Background: *Uncemented primary total hip replacement is an ideal choice for fracture neck of femur in patients of age 65 to 80 years meeting certain mobility, cognitive and health criteria. Though each approach has its own pros and cons, the search for best approach to do total hip replacement is still going on, in terms of limited complications and good functional outcome.*

Aim: *To analyze the functional outcome of uncemented primary total hip replacement done for fracture neck of femur through direct lateral approach.*

Materials & Methods: *Patients with displaced intra-capsular fracture neck of femur admitted in govt. vellore medical college in the time period Jan 2014 to July 2016 were selected and treated with primary uncemented total hip replacement through direct lateral approach. The post-operative outcomes were measured in terms of functional scoring and complications.*

Results: *Of the total 25 patients operated, 14 had good to excellent Harris' functional score, 3 patients had abductor insufficiency and 1 patient had trochanteric fracture. No patients had post-operative dislocation, nerve injury, chronic hip pain and limb length discrepancy.*

Conclusion: *We conclude that primary uncemented total hip replacement remains an ideal choice for selected displaced intra-capsular fracture neck of femur fractures and direct lateral approach is a technically easy one with fewer complications yielding very good functional outcome.*

KEYWORDS : fracture neck of femur, total hip replacement, direct lateral approach

Introduction:

The various options for managing displaced femoral neck fractures in active, 65 to 80 year-old individuals are internal fixation, hemiarthroplasty and total hip replacement. Internal fixation retains the femoral head and the natural hip joint, provided that the fracture unites and the head does not undergo avascular necrosis. The major complications include non-union and avascular necrosis, which would require a salvage procedure with either hemiarthroplasty or total hip replacement. Following fracture union, a second anesthetic might still be required to remove screws that back out. Hemiarthroplasty would be an ideal choice in individuals with many co-morbidities and a shorter life expectancy⁴. Total hip replacement can be performed as a primary procedure following a fracture of the neck of the femur in independently mobile patients with no co-morbidities, or as a salvage procedure following failed internal fixation, or as a revision following failed hemiarthroplasty⁵. The current literature recommends the use of total hip replacement (THR) for displaced intracapsular hip fractures in patients who meet certain mobility, cognitive and health criteria. Although, total hip replacement is not indicated for Garden I and II fractures in any age group, a fracture of the femoral neck in a young individual presenting within hours of sustaining the fracture, and a fracture of the femoral neck in old, frail, demented individuals.

A number of surgical approaches to the hip joint exist, each with unique advantages and disadvantages. The most commonly used approaches include the direct anterior, direct lateral and posterior approaches. A number of technical intricacies allow safe and efficient femoral and acetabular reconstruction when using each approach². Hip dislocation, abductor insufficiency, fracture and nerve injury are complications of THA, although their relative risk varies with each approach³. Numerous clinical trials have sought to elicit differences in patient-reported outcomes, complication rates and return to function among the surgical approaches¹. This study outlines some of the technical pearls and advantages of doing direct lateral approach.

Aim of the study

To analyze the functional outcome and complications of uncemented primary total hip replacement done for fracture neck of femur through direct lateral approach.

Materials and Methods

Ours was a prospective cum retrospective observational study conducted in Government Vellore Medical College & Hospital in the time period of Jan' 2014 to Jul' 2016. The patients with intracapsular fracture neck of femur admitted in our trauma ward were included based on the mentioned criteria. Patients were first put on skin traction on admission, stabilized, general condition improved, co-morbidities addressed with the help of general physician & specialists, pre-operative work up done according to protocol and with proper pre-medications, patients were then operated through direct lateral approach under epi-spinal anesthesia. Uncemented acetabular component was implanted for all cases, uncemented femoral component for Dorr type A & B and cemented for Dorr type C femur. Post-operative care and dislocation precautions were given. Serial radiographs and Harris' functional hip scoring were recorded. Functional outcome were graded as excellent, good, fair and poor.

Inclusion criteria

1. Garden's Type 3 & 4 Intracapsular fracture neck of Femur in age group 65 – 80.
2. Independently mobile with no aid or one stick pre-operatively.
3. Age 45 – 65 with risk factors for osteoporosis.

Exclusion criteria

1. Patients with major medical co-morbidities or cognitive impairment (ASA Gr >2)
2. Fractures previously treated with any form of internal fixation.

Results

The immediate post-operative outcomes were measured in terms of mitigation of pain, consumption of pain medication, length of hospital stay, recovery of function and mobility. The immediate complications were measured in terms of amount of blood loss, intra-operative fractures, nerve injury, post-operative dislocations and abductor insufficiency. The long term functional outcomes were measured in terms of Harris Hip Scoring, Quality of life, restoration of function and normalcy of gait.

Table 1 Age Distribution

Age Group	No. of Patients
<55	8
55-65	9
65-75	6
>75	2

Table 2 Sex Distribution

Sex	No. of Patients
Male	13
Female	12

Figure 1 Pre-op x-ray of patient 1



Figure 2 Post op x-ray of patient 1



Figure 3 Pre-op x-ray of patient 2.



Figure 4 Post op x-ray of patient 2.



All patients were well tolerating post-op pain with analgesic medications through epidural catheter for a period of 2 days. One patient who sustained greater trochanteric fracture needed an additional 2 days of analgesics. The average intra-operative blood loss was around 600 ml. Almost all of the patients were given 1 pint of blood transfusion in the per-operative or immediate post-op period. The average duration of hospital stay was 12 days. Almost all of the patients regained good range of hip joint movement. They were discharged once they were able to walk with walker.

One patient with severe osteoporosis had sustained greater trochanteric fracture during medullary reaming and she was treated with circlage wiring and post-operative de-rotation boot application. We encountered no case of post-op dislocation. None of the patients had superior gluteal nerve or femoral nerve injury.

Harris hip scoring was recorded for all patients at the end of 3 months and the functional outcome assessed in terms of excellent, good, fair, poor and failed result.

Table 3 Harris' Functional Scoring

Modified Harris' Hip Score	No. of Patients
Excellent (90-100)	3
Good (80-89)	11
Fair (70-79)	8
Poor (60-69)	3
Failed Result (<60)	-

The long term functional outcome was fairly good in many of the patients assessed in terms of gait, ability to use public transportation, distance walked and support used for walking. 3 patients had persistent trendelenburg gait, needed walker or cane permanently for walking and considered to have abductor insufficiency. No patients had significant limb length discrepancy, i.e., > 1 inch.

Discussion

Direct lateral approach was first described by Hardinge in 1962. It is one of the commonly done approaches nowadays for its simplicity, easier technique and lesser complications².

It is done by placing the patient in lateral decubitus position draping the limb free for easy dislocation and preparation. A longitudinal incision extending 3 cm proximal & 5 cm distal to greater trochanter is made, fascia split in-between TFL and Gluteus Maximus, gluteus medius split in its anterior one-third posterior two-third junction, extended along the vastus ridge so as to re-attach during closure. Superior gluteal nerve is prone for injury and is thus protected. Minimus is then split and capsulotomy is done to expose the joint. After extraction of the femoral head, acetabular preparation is done by placing Hohman's retractor anteriorly, posteriorly and inferiorly and Hibb's retractor to retract superior soft tissues. Femoral nerve is protected from traction injury while placing the anterior retractor. Medullary canal is prepared by externally rotating the limb with hip and knee flexed and kept in a sterile drape. Adequate soft tissue release should be done whenever needed to avoid fractures as there are reported trochanteric fractures in this approach. After preparations, trial prosthesis inserted, joint reduced and checked for alignment, stability, length and offsets. After confirmation, real prostheses inserted, capsule repaired and gluteus medius re-attached to avoid abductor insufficiency. The reasons for insufficiency are found to be denervation, muscle atrophy or redundancy.

Blood loss is usually very minimal in this approach. Post-op pain is also meager. As the posterior capsule is untouched, the chance of dislocation is almost negligible when compared to the posterior approach. Few cases of superior gluteal nerve and femoral nerve injury had been reported in the literature, but we didn't encounter any such incident. Chances of trochanteric fracture while reaming can be combated by adequate soft tissue release and proper positioning of the limb while reaming².

We had good to excellent functional outcome in 14 out of 25 cases in terms of Harris' hip functional score. None of the patients had limb length discrepancy, chronic hip pain related to prosthesis loosening complications. Thus, correlating with the literature, direct lateral approach for total hip replacement yields a very good functional outcome and very few complications³. But, further follow-up is needed to analyze the long term functional outcome in these patients.

Conclusion

In a series of 25 cases of displaced intracapsular fracture neck of femur meeting all the criteria for a total hip arthroplasty, an uncemented total hip replacement done through direct lateral approach in government vellore medical college hospital in the time period of 2014-2016 yielded a very good functional outcome and few complications in terms of good functional scoring, nil dislocation and nerve injuries, few abductor insufficiency and 1 case of trochanteric fracture.

Bibliography:

1. Meena S. Comparison of primary total hip replacements performed with a direct anterior approach versus the standard lateral approach: perioperative findings. *Journal of Orthopaedics and Traumatology: Official Journal of the Italian Society of Orthopaedics and Traumatology*. 2012;13(2):115. doi:10.1007/s10195-012-0190-2.
2. Petis S, Howard JL, Lanting BL, Vasarhelyi EM. Surgical approach in primary total hip arthroplasty: anatomy, technique and clinical outcomes. *Canadian Journal of Surgery*. 2015;58(2):128-139. doi:10.1503/cjs.007214.
3. Vicente JRN, Pires AF, Lee BT, Leonhardt MC, Ejnisman L, Croci AT. THE INFLUENCE OF THE SURGICAL APPROACH CONCERNING DISLOCATION IN TOTAL HIP ARTHROPLASTY. *Revista Brasileira de Ortopedia*. 2009;44(6):504-507. doi:10.1016/S2255-4971(15)30148-8.
4. Burgers PTPW, Van Geene AR, Van den Bekerom MPJ, et al. Total hip arthroplasty versus hemiarthroplasty for displaced femoral neck fractures in the healthy elderly: a meta-analysis and systematic review of randomized trials. *International Orthopaedics*. 2012;36(8):1549-1560. doi:10.1007/s00264-012-1569-7.
5. Zhao Y, Fu D, Chen K, et al. Outcome of Hemiarthroplasty and Total Hip Replacement for Active Elderly Patients with Displaced Femoral Neck Fractures: A Meta-Analysis of 8 Randomized Clinical Trials. Tranah G, ed. *PLoS ONE*. 2014;9(5):e98071. doi:10.1371/journal.pone.0098071.