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Clinical Profile of Patients Underwent Total Hip Replacement

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Abstract

Introduction: The hip joint functions on the bio-engineering principle of moment of force with a fulcrum, lever arm, power arm. Hip joint with the hemi-spherical femoral head articulating in the acetabular cup with abductor muscles acting at one end, the body weight on the other, and the joint itself being the fulcrum can be compared to a 'First order lever'. To describe the force acting on the hip joint, the body weight can be depicted as a load applied to a lever arm extending from the body's centre of gravity to the centre of the femoral head. *Methodology:* During our study period 56 patients met inclusion criteria, and all patients underwent total hip replacement either cemented or uncemented through modified lateral approach. Data was collected from previous operative records, regular follow-up x-ray films and follow-up records. *Results:* In our study, out of 56 patients, 46 patients (82.2%) had negative modified Trendelenburg test, whereas 10 patients (17.8%) had positive modified Trendelenburg test. Most of the positive modified Trendelenburg test patients were in secondary osteoarthritis group, 7 out of 10. *Conclusion:* The most common indication for Total Hip Arthroplasty in our study is displaced fracture neck of femur in elderly active patients.

Keywords: Total Hip Replacement; Trendelenburg Test; Total Hip Arthroplasty.

Introduction

Total hip replacement is one of the most successful and rewarding operations ever developed. This surgery has undergone considerable evolution during the past 40 years; not only have a large number of prosthesis designs been developed but a large number of surgical techniques and approaches have been described. Exposure of the hip for arthroplasty should provide adequate access to the acetabulum and the resected neck of the femur with minimal disturbance of muscle function. Multiple approaches to total hip arthroplasty have been described in the literature: Posterolateral, trans-trochanteric, direct lateral and Watson Jone's, recently mini-incision and minimally invasive hip approaches. Of all the approaches, the posterolateral [Moore's] and the direct lateral approaches are commonly used [1].

Despite these advances in total hip arthroplasty, dislocation remains a frequent complication and has been reported to be 3–5% for primary osteoarthritis. This incidence can increase up to 18% for total hip replacement used for fractured neck of femur [2]. Dislocation can occur even after good orientation of the components, proper tissue tension and still seen after the posterior approach, even in the hands of an experienced surgeon [3,4]. The cause for the increased incidence of prosthetic dislocation in fractured neck of femur is multi factorial. Poor prosthetic alignment is still a common cause for dislocation irrespective of type of approach. It has been reported that the movement in the replaced hip for a fractured neck of femur is greater than that for osteoarthritis and this may be a factor for increased incidence of dislocation

[5]. Confusion, mental competence and balance problems may also contribute to the higher incidence of dislocation.

The posterior approach is considered to be easy to perform however; increased rates of dislocation have been reported. To minimize, risk of dislocation, the capsule and short external rotators in the posterolateral approach is sutured to the trochanter [6] and dislocation rate of 5-8% has been brought down to 1-3%.

It is well reported that the incidence of dislocation is much lower in the lateral approach compared to other approaches [4,6]. The lateral approaches to the hip described by McFarland and Osborne (1954) and by Hardinge (1982) have two main advantages: they avoid the complication of trochanteric non-union associated with the Charnley technique (1970), and postoperative dislocation is less likely than with the posterior approach (Robinson, Robinson and Salvati 1980). However, the lateral approach requires reflection of the anterior fibres of gluteus medius and minimus from the greater trochanter, and one of the complications of this procedure is postoperative weakness of hip abduction. This may occur either through denervation of the gluteal flap, following damage to the inferior branch of the superior gluteal nerve or by failure to establish reattachment of the flap to the greater trochanter. Dall (1986) described a modification of the technique, in which a sliver of trochanteric bone is taken with the gluteal flap so as to allow better fixation of the flap to the greater trochanter during closure.

Methodology

61 primary total hip replacements were done for various indications, out of which 56 patients were available for the study. Both prospective and retrospective study was conducted to evaluate clinical and functional out come on patients treated with primary total hip replacement through modified lateral approach. The minimum period of follow up was 6 months and maximum period was 3 year 4 months with average being 20 months.

Inclusion Criteria

All patients who underwent primary Total hip replacement through modified lateral approach for various indications.

Exclusion Criteria

Patients who underwent surgery previously on the affected hip Neuromuscular disorders.

Revision total hip arthroplasty/ ASR

Medical conditions not permitting THR

Bilateral THR

Failed osteosynthesis and failed hemi arthroplasties were not included.

During our study period 56 patients met inclusion criteria, and all patients underwent total hip replacement either cemented or uncemented through modified lateral approach. Data was collected from previous operative records, regular follow-up X-ray films and follow-up records. In prospective cases pre-operative scoring and assessment were recorded in the hospital case sheets. In retrospective cases, it was obtained from the hospital case sheet and records.

On admission to the ward, a detailed history of the patients was taken. This included age, sex, occupation, complaints, associated medical illness. Following this, they were subjected to a thorough clinical examination and general condition was assessed and accordingly corrective measures were taken to correct the general being of the patients.

Routine blood investigations were done for all the patients. Special attention was paid to CRP and ESR and if these were abnormal, surgery was deferred. Standard anteroposterior and lateral X-rays were taken including pelvis with both hips. Analgesics, antibiotics, tetanus toxoid and blood transfusions were given as needed before surgery

Results

The average age of the patients was 54 years ranging from 39 years to 80 years. Out of 56 patients, 10 patients (17.9%) belonged to age group of 39-50 years. 10 patients (17.9%) belonged to age group of 51-60 years. 23 patients (41.0%) belonged to age group of 61-70 years. 13 patients (23.2%) belonged to age group of 71-80 years.

Out of 56 patients 31 (55.4%) patients were female and 25(44.6%) patients were male.

The most common indication for surgery was fracture neck of femur, the number being 37 (66.1%). The other causes were secondary osteoarthritis of hip in 10 patients (17.9%), non-union fracture neck of femur in 5 patients (8.9%), early and intermediate stages of avascular necrosis of the head of femur in 4 patients (7.1%).

Table 1: Age Distribution

Age in Years	No. of Patients	Distribution
39-50	10	17.9%
51-60	10	17.9%
61-70	23	41.0%
71-80	13	23.2%

Table 2: Sex Disrtibution

Sex	No. of Patients	Disrtibution
Female	31	55.4%
Male	25	44.6%

The causes of secondary osteoarthritis of the hip were

- Advanced stages of avascular necrosis of the head of femur - 2
- Rheumatoid arthritis - 2
- Healed tuberculosis - 2
- Old trauma to hip joint - 3
- OA Secondary to CoxaProfunda - 1

In our study, 35 patients (62.5%) had left sided affection, whereas 21 patients (37.5%) had right sided affection.

In our study, out of 56 patients, 46 patients (82.2%) had negative modified Trendelenburg test, whereas 10 patients (17.8%) had positive modified Trendelenburg test. Most of the positive modified Trendelenburg test patients were in secondary osteoarthritis group, 7 out of 10.

Table 3: Side Affected

Side Affected	No. of Patients	Distribution
Left	35	62.5%
Right	21	37.5%

Table 4: Trendelenburg test (modified)

Trendelenburg Test	No. of Patients	Distribution
Negative	46	82.2%
Positive	10	17.8%

Discussion

Total hip replacement is a permanent method of relieving pain in the hip due to various conditions. The aim of the surgery is to relieve pain, at the same time to preserve motion, muscle function and stability of the joint.

The study was carried on 56 patients who underwent primary Total Hip Replacement. In western literature, as per Harkess, Charnley and Efthekar total hip replacement has primarily been described for patients in older age group of sixty and above. In our study, 64.2% of the patients were found to be in the age group of above sixty, with the age ranging from 39 to 80 years with a mean age of 54 years. Majority, 31 were females (55.4%) and 25 (44.6%) were male patients.

The Harris hip score is the most widely used scoring system for evaluating hip arthroplasty. We used Harris hip score to assess functional outcome in our study 22 (39.2%) patients had excellent, 31 (55.4%) patients had good, 3 (5.4%) patients had fair result. No poor results noted.

The most common indication for Total Hip Arthroplasty in our study is displaced fracture neck of femur in elderly active patients. In a study done by Richard Blomfeldt et al on 84 patients, compared results of displaced femoral neck fracture treated with primary total hip replacement for displaced femoral neck fracture with secondary replacement after failed internal fixation, with 2 year follow up. Author concluded that a secondary THR after failed internal fixation results in inferior hip function compared to a primary THR for a displaced femoral neck fracture in the elderly active patient [7]. Other indications in our study were non-union fracture neck of femur, Secondary Osteoarthritis of hip and Avascular Necrosis of femoral head.

Trendelenburg test is a useful part of clinical examination and valuable in functional assessment. In our study, 46 (82.2%) patients had Trendelenburg test negative and only 10 (17.8%) patient had Trendelenburg test positive. In a study conducted by V S Pai (1996) on 264 patients to assess the effects of lateral approaches to total hip arthroplasty on abductor weakness and significance of trendelenburg test when the criteria of Hardcastle and Nade was

applied, a positive response was seen in 19% in the transtrochanteric group, 15% in the Liverpool group, and 18% in the Hardinge group.

Conclusion

The Trendelenburg test was negative in 82% of the patients following primary total hip replacement through modified lateral approach and most of the positive Trendelenburg test was seen in patients of secondary osteoarthritis group.

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