

Research Article

An evaluation of merits of total hip arthroplasty done for traumatic and non-traumatic displaced fracture neck of femur

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ABSTRACT

Background: There is ongoing controversy about the relative merits of different types of arthroplasty among specific groups of patients. Paucity of quality data provides an opportunity for extension of this debate. The aim of this study was planned to evaluate merits (outcomes and complications) of total hip arthroplasty done for traumatic and non-traumatic displaced fracture neck of femur.

Methods: A comparative evaluation was undertaken among 50 patients who underwent total hip replacement at a tertiary care center. A retrospective cohort of fifty patients treated with total hip replacement for traumatic causes of displaced fracture neck of femur (25 patients) and non-traumatic causes of displaced fracture neck of femur (25 patients) were included in this study. The inclusion criteria's for the traumatic group were acute displaced fracture neck of femur above 50 years and fracture neck with fracture head with dislocation above 50 years. Patients having nonunion fracture neck of femur, failed cancellous screw fixation, intertrochantric fractures and associated acetabulum fractures were excluded from this study.

Results: On clinical and functional evaluation, patients scored 84% excellent/good in non-traumatic group whereas 68% excellent/good score in traumatic group. 12% and 16% patients scored poor in non-traumatic group and in traumatic group respectively. In non-traumatic group, following complications were observed. Dislocation rate of 4% (one hip), 4% incidence of aseptic acetabular loosening (one hip), and 16% incidence of heterotrophic ossification (four hips). In traumatic group, we observed 2 (8%) dislocations, 4 (16%) heterotopic ossifications. Loosening of acetabulum and subsidence were observed in two (8%) patients.

Conclusions: There are higher chances of dislocation among patients undergoing total hip replacement for a traumatic indications as compared to their non-traumatic indications. Chances of dislocation can be curtailed by keeping known factors in mind along with careful patient selection, adherence to postoperative protocol and use of a lateral approach with large head in high risk patients.

Keywords: Merit, Complication, Dislocation, Fracture neck of femur, Posterior approach, Total hip replacement

INTRODUCTION

Total hip arthroplasty (THA) is a very common procedure

in orthopedic surgery.¹ Total hip arthroplasty is often indicated to relieve pain and increase range of motion in patients with arthritis and other collagen diseases.²

Postoperative hip dislocation is one of the major complications and has been reported in 0.5 to 10.6 % of patient after primary THA.^{3,4} Surgical technique and approach as well as implant selection, implant positioning, patient education and patient-related factors have an impact on the incidence of dislocations. Total hip replacement is one of the most successful and cost-effective interventions in orthopedic surgical field.⁵ Hip replacements have transformed the lives of hundreds of thousands of people regardless of the underlying etiology.⁶

Total hip arthroplasty is an operation to restore motion and stability to a joint and function to the muscle, ligaments and other soft tissue structures that control the joint. Implanting an artificial head and socket to replace the degenerated head, fractured head exerted such a profound social impact and enjoyed such a dramatic early success. Various immediate and long term complications may compromise this procedure, but it still remains the greatest boon available to orthopedic patients, and has proved to be the greatest advancement in the field of orthopaedic surgery in the twenty first century.⁷

The role of arthroplasty for an acute displaced femoral neck fracture is still a matter of debate.⁸ There is ongoing controversy about the relative merits of different types of arthroplasty among specific groups of patients. There is a group of surgeons, which favour THR for an acute displaced femoral neck fractures but on the other hands, another group of surgeons do not favour this. Paucity of quality data provides an opportunity for extension of this debate. Therefore keeping above facts in mind this study was planned to evaluate merits (outcomes and complications) of total hip arthroplasty done for traumatic and non traumatic displaced fracture neck of femur. Our secondary objective was to evaluate whether dislocation rate is higher in total hip replacement done for acute displaced fracture neck of femur.

METHODS

A comparative evaluation was undertaken in the department of orthopedics in collaboration with department of surgery among 50 patients who underwent Total hip replacement at a tertiary care center. A retrospective cohort of fifty patients treated with total hip replacement for traumatic causes of displaced fracture neck of femur (25 patients) and non traumatic causes of displaced fracture neck of femur (25 patients) were included in this study. Patients were divided into two groups traumatic and non traumatic group. Follow-up period was taken as five years.

Non-traumatic indications for Total hip replacement included avascular necrosis of femoral head (12 patients), rheumatoid arthritis (6 patients), ankylosing spondylitis (5 patients), and osteoarthritis (2 patients). Traumatic group also had 25 patients. The inclusion criteria's for the traumatic group were acute displaced fracture neck of

femur above 50 years and fracture neck with fracture head with dislocation above 50 years. Patients having nonunion fracture neck of femur, failed cancellous screw fixation, intertrochantric fractures and associated acetabulum fractures were excluded from this study. We did the uncemented hip replacement in males below 60 years and females below 55 years of age.⁹ However the cemented hip replacement was used in patients for whom economy was a constraint. All patients underwent surgery by posterior approach only.

Modified Harris hip score was used for clinical and functional evaluation of patients.¹⁰ Plain X-ray pelvis with both hips and proximal femur—AP view and X-ray of the operated hip lateral view for radiological evaluation. The Brookers classification was used to assess Heterotrophic Ossification.¹¹ The Andrew Whaley and Daniel criteria for uncemented cups and the De Lee and Charnley criteria for cemented cups were used to assess cup loosening.¹² The Gruen zones for cemented stems and the Enghs criteria for uncemented stems were used to assess femoral stem loosening.¹³ Other radiological components that were taken into consideration were cup inclination, femoral stem position, vertical subsidence of femoral component, vertical migration of acetabular component and heterotrophic ossification.

The study adhered to the tenets of the declaration of Helsinki for research in humans. Informed consent was obtained from patients after discussion of the advantages and risks. Permission of Institutional ethics committee (IEC) was sought before the commencement of the study. All the questionnaires were manually checked and edited for completeness and consistency and were then coded for computer entry. After compilation of collected data, analysis was done using statistical package for social sciences (SPSS), version 20 (IBM, Chicago, USA). The results were expressed using appropriate statistical methods.

RESULTS

Data of fifty patients treated with total hip replacement for traumatic causes of displaced fracture neck of femur (25 patients) and non traumatic causes of displaced fracture neck of femur (25 patients) were included in this study. Regarding clinical and functional evaluation of study subjects using Harris hip score. Patients scored 84% excellent/good in non traumatic group whereas 68% excellent/good score in traumatic group. 12% and 16% patients scored poor in non traumatic group and in traumatic group respectively (Tables 1).

In non traumatic group, following complications were observed. Dislocation rate of 4% (one hip), 4% incidence of aseptic acetabular loosening (one hip), and 16% incidence of heterotrophic ossification (four hips). In traumatic group, we observed 2 (8%) dislocations, 4 (16%) heterotrophic ossifications. Loosening of acetabulum

and subsidence were observed in two (8%) patients. (Table 2).

Table 1: Clinical and functional evaluation of study subjects using Harris hip score.

Harris hip score	Number	Percentage
Clinical and functional evaluation of patients in non traumatic group		
Excellent (90-100)	14	56
Good (80-89)	7	28
Fair (70-79)	1	4
Poor (<70)	3	12
Clinical and functional evaluation of patients in traumatic group		
Excellent (90-100)	12	48
Good (80-89)	5	20
Fair (70-79)	4	16
Poor (<70)	4	16

Table 2: Complications among study participants.

Complications	Number	Percentage
Complications among patients in non traumatic group		
Dislocation	1	4
Heterotropic ossification	4	16
Subsidence	0	0
Loosening	1	4
Complications among patients in traumatic group		
Dislocation	2	8
Heterotropic ossification	4	16
Subsidence	1	4
Loosening	1	4

DISCUSSION

Total hip arthroplasty, or surgical replacement of the hip joint with an artificial prosthesis, is a reconstructive procedure that has improved the management of those diseases of the hip joint that have responded poorly to conventional medical therapy. Current evidence suggests that traditional total hip replacements last more than 10 years in more than 90% of patients. More than 90% of patients report having either no pain or pain that is manageable with use of occasional over-the-counter medications. The large majority of hip replacement patients are able to walk unassisted (i.e. without use of a cane) without any limp for reasonably long distances.⁸

Like any major surgical procedure total hip replacement is associated with certain medical and surgical risks. Although major complications are uncommon they may occur. This procedure is riddled with a large number of long-term complications ranging from dislocations including recurrent dislocations. Primary endoprosthetic replacement has been advocated to improve survival by eliminating fracture fixation and healing problems and by

allowing early mobilization. Conventional treatment for fracture neck of femur, grade 1 and 2, is open reduction and internal fixation, whereas, that for grade 3 and 4 is still controversial.

Regarding functional outcome, our study showed that hip replacement for patient in non traumatic group had better outcome as indicated by better Harris hip score than the traumatic group. We had 84% excellent/good results in non traumatic group 68% excellent/good result in traumatic group. The result of this study is in agreement with previous study from Tamil Nadu, India.¹⁴

In non traumatic group we had one case of dislocation (4%). The dislocation occurred during the first month of the surgery at home. The patient was treated by open reduction and trochantric osteotomy. Another study observed increased rate of dislocation following posterior approach. His study shows dislocation rate of 2.8% following posterior approach. His findings are in concordance with our observations.¹⁵ Philips studied incidence rates of dislocation along with other parameters after elective total hip replacement and observed dislocation rate of 3.9%.¹⁶ The incidence of dislocation was highest during the immediate post-operative period but remain elevated throughout the first three post operative months.

Regarding post-operative dislocation, in traumatic group we had two cases of dislocation. One patient had a dislocation within 5 days of surgery and the other had a dislocation on the eleventh post-op day and other within 3 weeks following the surgery. Studies have shown that total hip arthroplasty done for fracture neck of femur has a higher dislocation rate than total hip arthroplasty done for other causes.¹⁷ In our study the dislocations occurred within a month after surgery. This concurs with the findings of others, which have reported a higher rate of dislocations in the first month following surgery. These patients were managed by open reduction and kept on abduction splint for 6 weeks. Khan et al in his study found that the incidence of dislocated prosthetic hip could be reduced by greater attention to certain details of patient selection and technique of insertion.¹⁸ Factors predisposing to dislocation include mentally confused patient, uncontrolled epileptic and weakness of hip muscles due to neurological disorder and previous operation of the hip. Sixty-nine patients who dislocated, the precipitating cause were rotation combined with flexion and extension (bending to cut toe nails, leaning forward from sitting position etc.). Smaller head size and posterior approach was the most common cause of dislocation as observed by another author.¹⁹

CONCLUSION

On the basis of empirical evidences of this study it can be concluded that there are higher chances of dislocation among patients undergoing total hip replacement for a traumatic indications as compared to their non traumatic

indications. Chances of dislocation can be curtailed by keeping known factors in mind along with careful patient selection, adherence to postoperative protocol and use of a lateral approach with large head in high risk patients.

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