

## ASSESSMENT OF THE QUALITY OF RECONSTRUCTION IN TOTAL HIP ARTHROPLASTY DONE IN PATIENTS AFTER ACETABULUM FRACTURE

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### Abstract

**Background:** Acetabular fractures are complex orthopaedic injuries and require a fair amount of expertise for management. Although undisplaced acetabular fractures can be managed by nonoperative means, displaced acetabular fractures need operative intervention for reduction and stabilization.

**Methods:** The study was carried as a retrospective study, from February 2013 to July 2014. After getting the approval from the Ethics Committee of the Institute (Annexure I) and the consent from the patients the study was conducted on 49 patients who underwent Total Hip Arthroplasty after fracture acetabulum.

**Results:** On evaluation, patients at short term follow up had good clinical outcome on the basis of Harris hip score. The Harris hip scores improved progressively in the patients at 2-4 years follow up having mean HHS of 92 which further increased to 97 in patients who were followed up after 4 years. The patients at short term follow up of up to 2 years had comparatively lower quality of life scores when compared to the follow up at 2-4 years. The patients followed up after 4 years had the best quality of life.

**Conclusion:** We concluded that total hip arthroplasty after acetabulum fracture, as a result of good quality of reconstruction, a good functional outcome leads to improved quality of life in the patients.

**Keywords:** Hip, Arthroplasty, Reconstruction.

### Introduction

Acetabular fractures are complex orthopaedic injuries and require a fair amount of expertise for management. Although undisplaced acetabular fractures can be managed by nonoperative means, displaced acetabular fractures need operative intervention for reduction and stabilization.<sup>1,2</sup> As these fractures involve one of the important joints of the body, anatomic reduction and internal fixation is the primary aim<sup>1</sup> of operative management.

Incidence of acetabular fractures has seen an increase in the elderly population as osteoporosis contributes in fractures caused by low energy falls.<sup>3,4</sup>

The acetabulum has a complex anatomy and the described surgical approaches do not provide complete visualization of the entire acetabulum, thereby making anatomical reduction difficult in many cases. Even after a reasonable reduction, outcome may not be good in every case.

The outcome of acetabular fracture may be compromised by secondary osteoarthritis, femoral head avascular necrosis and/or heterotopic ossification, even when anatomic reconstruction of the joint had been achieved.<sup>5</sup> In developing countries where adequate healthcare facilities are often lacking, many acetabular fractures requiring operative management are managed non-

operatively and these have a greater chance of developing complications.

### Materials and Methods

**Patient Selection:**

The study was carried as a retrospective study, from February 2013 to July 2014. After getting the approval from the Ethics Committee of the Institute (Annexure I) and the consent from the patients the study was conducted on 49 patients who underwent Total Hip Arthroplasty after fracture acetabulum.

### Inclusion Criteria

Patients who had undergone total hip arthroplasty in the past 7 years following fracture of the acetabulum, by a single surgeon.

### Exclusion Criteria:

1. Debilitating medical or surgical illness or generalized illness or co morbidities leading to restriction of physical activities.
2. Any associated foot, ankle, knee injury or disease likely to affect the overall functional outcome.
3. Associated spine injury.
4. Any neurological or psychiatric ailments interfering with the assessment of general health of the case.
5. THA done more than 7 years ago.

### Groups

Patients were divided into

1. Four groups based on the diagnosis.
2. Two groups on the basis of treatment received after fracture acetabulum
3. Three groups based on the indication of THA
4. Two groups based on the surgical intervention.

Detailed history of the patients was taken for the aetiology of the primary disease. All the patients included in the study underwent complete clinical and radiological evaluation.

### Results

A total of 49 patients with 49 hips with Total hip Arthroplasty were followed as per the predefined inclusion and exclusion. All the patients were included in the study

after informed consent. The patients were recruited through the outpatient department of orthopaedics, PGIMER. An independent observer, other than the surgeon who operated, evaluated all these patients at the follow up. The patients were divided into various groups depending on the type of fracture, the indication for the THA and the type hip replacement done.

The mean age of the patients was 48.6 years with a standard deviation of 15.9 years with range between 25 and 83 years. Among the various age groups there were 8 patients under 35 years, 19 patients in the age group 35 to 48, 14 patients in the age group of 48 to 60 and 8 patients were above 60 years. In our study, young adults in the age group 35-48 years form the largest group.

**Table 1: Age distribution:**

| Age Category (yrs.) | Mean         | N         | Std. Deviation | Minimum   | Maximum   | Std. Error of Mean |
|---------------------|--------------|-----------|----------------|-----------|-----------|--------------------|
| <35                 | 28.75        | 8         | 3.327          | 25        | 34        | 1.176              |
| 35-48               | 41.11        | 19        | 4.520          | 35        | 47        | 1.037              |
| 48-60               | 55.93        | 14        | 3.245          | 50        | 60        | .867               |
| >60                 | 73.75        | 8         | 7.126          | 62        | 83        | 2.520              |
| <b>Total</b>        | <b>48.65</b> | <b>49</b> | <b>15.117</b>  | <b>25</b> | <b>83</b> | <b>2.160</b>       |

The patients were followed up after the THA and were divided into 3 groups. First group had patients followed up within 2 years of THA, second group had patients followed up between 2-4 years and the third group had patients followed up at more than 4 years.

**Table 2:**

| FOLLOW UP PERIOD (yrs.) | FREQUENCY |
|-------------------------|-----------|
| 1 Upto 2 years          | 26        |
| 2 2- 4 years            | 15        |
| 3 >4 years              | 8         |

The patients at the follow up were evaluated clinically. For evaluation of the hip function Harris hip score was used. The patients in each group were also evaluated for the quality of life using SF-12, SMFA and the WHOQOL-BREF.

On evaluation, patients at short term follow up had good clinical outcome on the basis of Harris hip score. The Harris hip scores improved progressively in the patients at 2-4 years follow up having mean HHS of 92 which further increased to 97 in patients who were followed up after 4 years.

The patients at short term follow up of up to 2 years had comparatively lower quality of life scores when compared to the follow up at 2-4 years. The patients followed up after 4 years had the best quality of life.

The improving trend of Harris hip scores was consistent with improving quality of life on the basis of SF-12, SMFA and the WHOQOL-BREF in these patients.

**Table 3: NPar Tests**

|              |           | N  | Mean    | Std. Deviation | Minimum | Maximum | p-value |
|--------------|-----------|----|---------|----------------|---------|---------|---------|
| SHHS         | upto 2yrs | 26 | 84.3846 | 15.02818       | 58.00   | 100.00  | .207    |
|              | 2-4 yrs   | 15 | 92.0000 | 8.83984        | 74.00   | 100.00  |         |
|              | >4 yrs    | 8  | 97.1250 | 7.35697        | 79.00   | 100.00  |         |
| PCS          | upto 2yrs | 26 | 44.32   | 11.400         | 22      | 57      | .060    |
|              | 2-4 yrs   | 15 | 50.86   | 6.389          | 42      | 57      |         |
|              | >4 yrs    | 8  | 54.01   | 6.285          | 39      | 57      |         |
| MCS          | upto 2yrs | 26 | 56.02   | 5.588          | 44      | 64      | .806    |
|              | 2-4 yrs   | 15 | 54.33   | 8.345          | 35      | 61      |         |
|              | >4 yrs    | 8  | 58.40   | 4.405          | 48      | 61      |         |
| SMFA SCORE   | upto 2yrs | 26 | 14.15   | 13.590         | 0       | 40      | .494    |
|              | 2-4 yrs   | 15 | 10.24   | 10.802         | 0       | 34      |         |
|              | >4 yrs    | 8  | 3.35    | 5.681          | 0       | 17      |         |
| WHO QOL BREF | upto 2yrs | 26 | 74.3462 | 18.70549       | 36.00   | 100.00  | .116    |
|              | 2-4 yrs   | 15 | 84.5000 | 16.15632       | 61.00   | 100.00  |         |
|              | >4 yrs    | 8  | 94.5625 | 9.76578        | 72.00   | 100.00  |         |

## Discussion

Total hip arthroplasty is a common, one of the most successful and cost-effective procedures in Orthopaedics. It remains the treatment of choice for long-term pain relief and restoration of function for patients with pathologies of hip. In recent time, we have seen a constant rise in the post traumatic hip as the indication for hip arthroplasty. Planning a THA after fracture acetabulum poses a number of challenges to the surgeon.

With different aetiologies, different biomechanical situations are dealt with during THA after acetabular fracture. The aim of this study is to find out the quality of reconstruction in total hip arthroplasty done in patients after acetabular fracture and further correlate the quality of reconstruction with the affected hip function and quality of life in these patients.

At the latest evaluation, out of 49 patients, we had 26 patients with follow up period of 2 years post THA, 15 patients with follow up period of 2 to 4 years and 8 patients with follow up period of more than 4 years post THA. We grouped our patients into 3 categories based on the period of follow up. First group with FU of up to 2 years as short term; second group with FU of 2 to 4 years as intermediate term and third group as the long term FU.

On clinical evaluation, patients at short term follow up had good clinical outcome with mean Harris hip score of 84.34 points. The Harris hip scores improved progressively to excellent in the patients at 2-4 years follow up having mean HHS of 92 which further increased to 97 in patients who were followed up after 4 years (range, 4-7 years). There was significant improvement in the Harris hip score when patients at 2 years FU were compared with patients at FU of more than 4 years. Whereas there was no significant difference in the clinical outcome of patients

between FU period of 2 years and 2- 4 years and also between 2-4 years and more than 4 years.

Similar trend of improvement in the quality of life was also noticed on the basis of follow up period of patients after THA. The WHOQOL scores at 2 years, 2-4 years and more than 4 years were 74.34, 84.5 and 94.56 respectively. The SMFA scores at 2 years, 2-4 years and more than 4 years were 14.15, 10.24 and 3.3 respectively. There was significant difference in the quality of life between patients with FU period of 2 years and more than 4 years. Again no statistical difference could be found in the quality of life in the patients between FU period of 2 years and 2- 4 years and also between 2-4 years and more than 4 years.

## Conclusion

We concluded that total hip arthroplasty after acetabulum fracture, as a result of good quality of reconstruction, a good functional outcome leads to improved quality of life in the patients.

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