



# **Total Hip Replacement After Acetabular Fracture**

## **A systematic review of literature**

*Submitted for partial fulfillment of master degree in*

*Orthopedic Surgery*

Presented by

**Magdy Gamil Mazeed Mandlon**

*M.B., B.Ch*

Supervised by

**Prof. Dr. Osama Mohamed Elsayed**

*Assistant Professor of Orthopedic Surgery Department*

*Faculty of Medicine, Ain Shams University*

**Dr. Ahmed Mohamed Mohassab**

*Lecturer of orthopedic surgery department Faculty of  
Medicine, Ain Shams University*

**Faculty of Medicine  
Ain Shams University**

**2017**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

لَسْبَحَانَكَ لَا عِلْمَ لَنَا  
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ  
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

سورة البقرة الآية: ٣٢



## Acknowledgement

*First and foremost thanks to **ALLAH**, the Most Merciful.*

*I wish to express my deepest thanks, gratitude and appreciation to Prof. **Dr. Osama Mohamed Elsayed**, Assistant Professor of Orthopedic Surgery, Ain Shams University for his meticulous supervision, kind guidance, valuable instructions and generous help.*

*I am deeply thankful to **Dr. Ahmed Mohamed Mohassab**, Lecturer of Orthopedic Surgery, Ain Shams University for his great help, outstanding support, active participation and guidance.*

***Magdy Gamil Mazeed***

## *Contents*

<b>Subjects</b>	<b>Page</b>
• List of Abbreviations .....	I
• List of table .....	II
• List of Figures .....	III
• Introduction .....	1
• Aim of the Work.....	3
• Materials and Methods.....	4
• Review of literature: .....	
Chapter 1: Anatomy of acetabulum .....	5
Chapter 2: Classification of acetabular fracture .....	14
Chapter 3: causes and timig of THR.....	17
Chapter 4: Treatment modalities and systematic review. .	36
• Summary .....	51
• Conclusion .....	54
• References .....	57
• ﷂ Arabic Summary .....	63

---

## *List of Abbreviations*

<b>THR</b>	: Total hip replacement
<b>HHS</b>	: Harris Hip Score
<b>HO</b>	: Heterotopic ossification
<b>Rev</b>	: Revision
<b>TE</b>	: Thrombo-embolic
<b>AVN</b>	: Avascular necrosis

## *List of Table*

<i>Tab. No.</i>	<i>Subject</i>	<i>Page</i>
<b>Table (1)</b>	Hospital and country of each study	38
<b>Table (2)</b>	Analysis of studies ( type of study, number of patients , age and Follow up )	41
<b>Table (3)</b>	Initial management of acetabular fracture	42
<b>Table (4)</b>	Harris Hip Score pre and post Total hip replacement after acetabular Fracture	43
<b>Table (5)</b>	Complications of Total hip replacement after acetabular fracture	48

## *List of Figures*

<i>Fig. No.</i>	<i>Subject</i>	<i>Page</i>
<b>Fig. (1)</b>	The inverted Y containing the acetabulum	5
<b>Fig. (2)</b>	The column concept as devised by Judet in these Extrapelvic and intrapelvic schematic views of the pelvic bone	6
<b>Fig. (3)</b>	The posterior column from the back as seen in an iliac oblique view	7
<b>Fig. (4)</b>	Obturator oblique profile of the iliac bone	8
<b>Fig. (5)</b>	Quadrilateral plate	10
<b>Fig. (6)</b>	Blood supply on the inner aspect of the pelvis	12
<b>Fig. (7)</b>	Blood supply on the inner aspect of the pelvis	12
<b>Fig. (8)</b>	Blood supply on the outer aspect of the pelvis	13
<b>Fig. (9)</b>	Letournel and Judet classification of acetabular fractures	16
<b>Fig. (10)</b>	2 month old neglected acetabular fracture, b open reduction and internal fixation was performed using 3.5 mm reconstruction plates	31
<b>Fig. (11)</b>	4 month old neglected acetabular fracture with protrusio treated with cemented total hip replacement	32
<b>Fig. (12)</b>	3.5 month old neglected acetabular fracture with dislocated hip joint	34
<b>Fig. (13)</b>	5 month old acetabular fracture with posterior acetabular defect and protrusio	35
<b>Fig. (14)</b>	Anteroposterior radiographs of a 35-year-old female patient who underwent early total hip replacement, a) pre-operatively, b) two weeks post-operatively and c) at six months post-operatively	44
<b>Fig. (15)</b>	a&b&c pre acetabular fracture x ray	45
<b>Fig. (16)</b>	After acute THR	46
<b>Fig. (17)</b>	(A) A complete x-ray series included a film taken at the time of injury. (B) A film of the failed ORIF or non-ORIF treatment that led to arthropathy. (C) A film taken immediately after THA. (D) A film taken at the patients' most recent clinical visit (in this case, 9.7	47

---

---

*List of Figures*

---

<i>Fig. No.</i>	<i>Subject</i>	<i>Page</i>
	years postoperatively)	
<b>Fig. (18)</b>	Cementless total hip reconstruction in a 20-year-old woman	49
<b>Fig. (19)</b>	(A) Left acetabular T-fracture in a polytrauma 55-yearold woman after a car accident . (B) Anteroposterior radiograph of the prosthesis at 12 years follow-up with no evidence of loosening	50



## **ABSTRACT**

**Background:** Total hip replacement (THR) after acetabular fracture is a complex procedure and presents the surgeon with unique challenges. THR maybe indicated in two distinct clinical scenarios; firstly, if an acute acetabular fracture would result in a predictably poor outcome if treated with open reduction and internal fixation (ORIF), and secondly (and most commonly) after a patient develops post-traumatic arthritis after either non-operative or operative treatment of an acetabular fracture.

**Purpose:** Purpose of this article wad to assess the outcome of total hip replacement in the management of selected acetabular fractures among adult with traumatic hip arthritis.

**Methods:** Prospective and retrospective studies of 494 patients who underwent primary total hip arthroplasty for acute Acetabular fractures. The study was done in different places. Collected during the period from 1990 to Jan 2015. **Results:** in our series of primary total hip replacement for acute acetabular fractures

we had excellent/good results. Mean Harris Hip Score = 82.5.

**Conclusion:** primary total hip replacement is a reasonable method of treatment of selected acetabular fractures and good method for treatment neglected acetabular fracture. Outcomes may not be as good as total hip replacement done for other conditions.

### **Keywords**

Acetabular fracture, Post traumatic arthritis, Harris hip score, total hip replacement after acetabular fracture.

## **Introduction**

The hip is a weight bearing joint and is involved approximately in all movements of the body.

In the past, acetabular surgery and its fixation was not as common as today. Many patients were treated with long time skeletal traction (about 3 months), this type of treatment has some complications as malunion, nonunion in some region of acetabulum, bed sores, muscle atrophy and weakness around hip and knee joint, kidney stones, GIT malfunction and the most serious complication from long standing bed set is deep venous thrombosis<sup>(1)</sup>.

With Open reduction and internal fixation of acetabular fracture, patient can mobilize earlier, that's why fixation of acetabular fracture is getting popularity in recent years.

Associated complications of these surgeries could be infection, sciatic nerve injury, avascular necrosis, Some of these complications have no definitive treatment like sciatic nerve injury.

Other complications as degenerative joint disease and avascular necrosis can be managed by total hip replacement<sup>(2)</sup>.

Total hip replacement after pervious operations for internal fixation of fractured acetabulum is not a simple and straight forward operation<sup>(3)</sup>.

Many authors have reported highly diverse clinical and radiographic outcomes after a total hip arthroplasty was performed to manage an acetabular fracture. The diversity of the results is not surprising in the view of the heterogeneity of the fracture patterns and the diverse methods of primary fracture management. In most studies the primary problem was the premature loosening of cups<sup>(4)</sup>.

A lot of complications could be found also after total hip arthroplasty as infection, recurrent dislocation, sciatic nerve palsy and Heterotopic ossification<sup>(5)</sup>.

Sciatic nerve palsy can occur iatrogenically from total hip arthroplasty, regardless of the operative approach used. reported one sciatic nerve palsy in a study involving 21 acetabular fractures treated with a delayed cementless total hip arthroplasty using a modified anterior approach. However, the authors did not specify whether this nerve palsy was present pre- or postoperatively<sup>(6)</sup>.

That's why good planning for total hip replacement is needed and that depends on patient, implant, approach and muscle status<sup>(7)</sup>.

## **Aim of the work**

The aim of this review is to collect and analyze the existing evidence related to results of total hip arthroplasty after acetabular fracture surgery and its prerequisites and possible complications published in literature in English from 1990 to 2015, and to recommend treatment algorithms that could be valuable in everyday clinical practice.

## **Materials and methods**

This is a systematic review article on total hip replacement after acetabular fractures.

Pubmed search will be done in the last 16 years ( 1990 – 2015) on the following titles :

Results of total hip arthroplasty after acetabular fracture.

### **Inclusion criteria:**

- 1- English language literature .
- 2- Human studies .
- 3- Article types : clinical trial, comparative study, systematic reviews, meta analysis and case series study .
- 4- Age from 18 – 60 years .
- 5- Traumatic fractures .

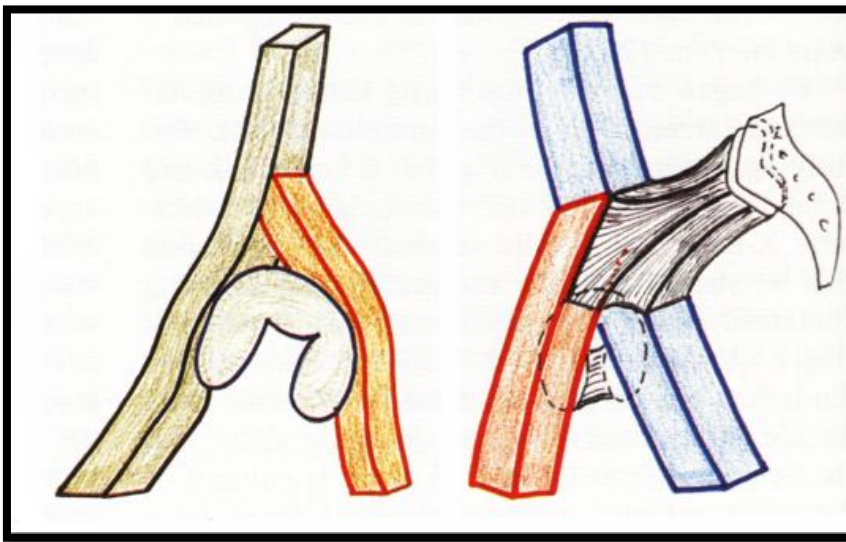
### **Exclusion criteria :**

1. Fracture in people aged below 18 years or above 60 years.
2. Pathological fractures.

## **Anatomy of the acetabulum**

### **The column concept of the acetabulum**

One must be adapt at three-dimensional vision to master the complex anatomy of the acetabulum. From its lateral aspect, it is better to regard the acetabulum as being contained within the open arms of an inverted Y (Fig. 1)<sup>(8)</sup>.



**Fig. 1:** The inverted Y containing the acetabulum<sup>(8)</sup>.

It is formed by a posterior column { the ilio-ischial component } and an anterior column { the ilio-pubic component } which is much longer and extends from the anterior end of the iliac crest to the pubic symphysis. The upper end of the posterior column is attached to the posterior aspect of the anterior column, a little above its mid-level (Fig. 2)<sup>(9)</sup>.