

## Case Report Treatment of Multi Fragment Radial Head Fracture with ORIF (Open Reduction and Internal Fixation with Radial Head Form Plate)

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### Abstract

Important role of the radial head in the elbow joint and stability of the forearm have aroused greater attention. Significant changes have taken place in the treatment of radial head fractures. All treatment modality discussed provide satisfactory outcomes for patients in the majority of cases at short term follow-up.

### Introduction

Radial head fractures (RHF) constitute one-third of the fractures around the elbow joint and 1.5-4% of all fractures [1]. Almost 75% cases of radial head fractures are associated with posterior dislocation of the elbow joint [2]. The radial head adds stability to the elbow joint when the medial collateral ligament and lateral ulnar collateral ligament have been compromised after injury or surgical procedure [3]. Commonly, ORIF, resection or radial head replacement procedures are performed to manage radial head and neck fracture along with dislocation [1-4]. Physical therapy assists the patient in regaining mobility, strength, and function.

The use of therapeutic intervention postoperatively has been shown to be beneficial [1,3]. However, documented use of manual therapy techniques (i.e. mobilization, muscle energy technique (MET), and soft tissue mobilization) in these cases is limited. The objective of this study is to present a protocol in maximum, moderate and minimum protection phase after radial head replacement surgery, since we found limited literature on physical rehabilitation post radial head replacement.

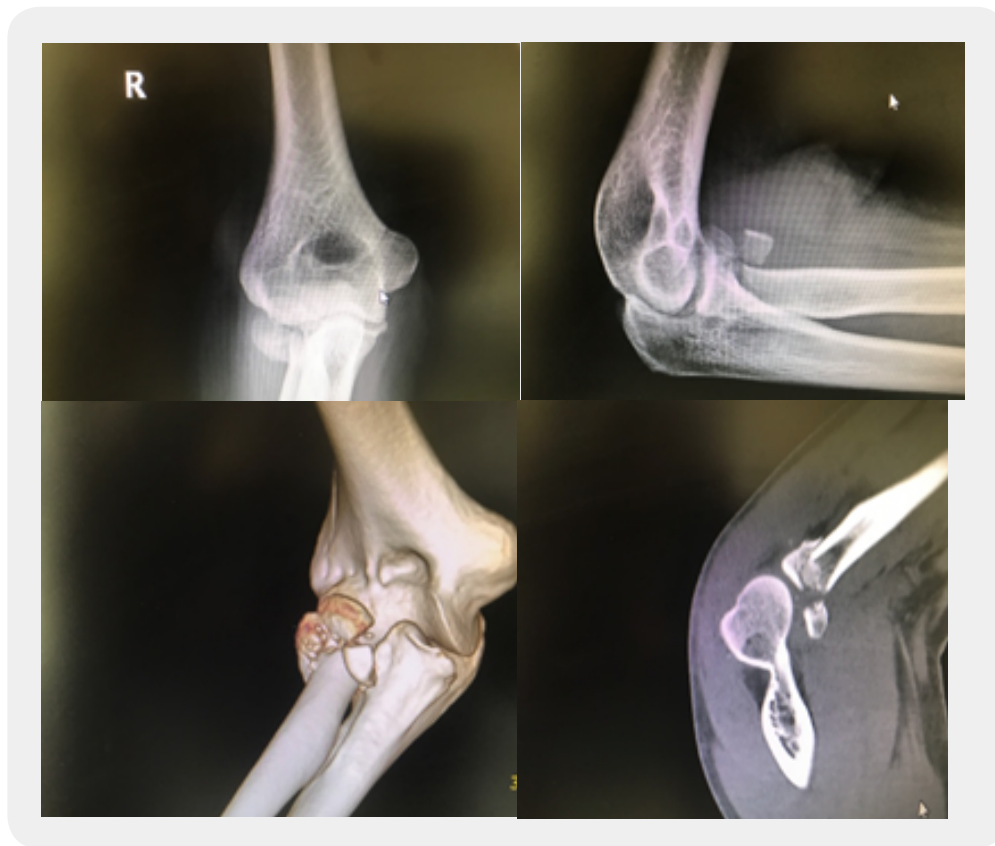
## **Materials and Methods**

This is a retrospective study concerning 2 cases of the radial head fracture treated at orthopedic surgery department in Dr. Sulaiman Alhabib hospital of Dubai for the period from July 2017 to July 2018. We adopted the classification of Mason amended to clarify the therapeutic indications, evaluate the results and determine the prognosis of these fractures. A preferential involvement in young with an average age of 39. The indirect mechanism by falling on the palm of the hand is the main etiology of these fractures. Mason type III-IV fractures of radial head are the most dominant in our cases. Injuries associated with these fractures were found in 1 patient and were dominated by the shoulder dislocation on same side of injured elbow. Our patients were treated after a mean period of 22 hours. Our patients underwent surgical treatment which was based on surgical fixation with radial head form plate from Synthes.

### **Case Report 1**

Male patient 39 years old, fall down on the right hand with extended elbow joint while doing sport activities in Fitness Gym. (11.July.2017)

He had severe pain, limitation of movement in elbow joint specially rotation and progressive swelling. In Emergency Department Clinical Examination reveals suspect of Elbow Joint injury, After X-ray it shows no dislocation of the Elbow joint, but multi fragment radius head fracture. For pre-operative plan, CT Done it show multi fragment displaced radius head fracture Mason III,IV. Fig (a-b)



*Figure: a*

*Figure: b*

***Clinical Examination***

Right Elbow, Diffuse swelling, Haematoma on lateral side of the elbow, tenderness over proximal forearm,

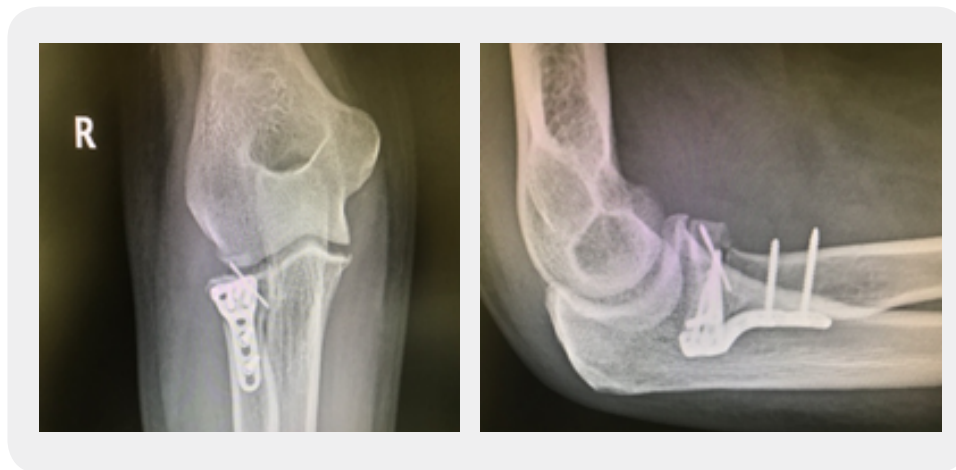
Movement; Extension - Flexion 0-60-80

Supination - Pronation 0-10.40

***Treatment***

1<sup>st</sup>: Joint stabilization with above elbow Slap, ice therapy, Elevation.

2<sup>nd</sup>: Surgical Treatment with ORIF, (Open reduction and internal fixation with Radial head form Plate)  
Fig 1-2

**Figure: 1****Figure: 2**

**Material Used:** LCP Proximal radius plate 2.4 right, 3 Locking screws 2.4 mm, and 3 cortex screws 2.4 mm, 1 Kwire 1.2mm.

### ***Post-Operative Phase***

- 1-above elbow slap for 2 weeks.
- 2-passive movement of elbow flexion and extension. No rotation for next 2 weeks.
- 3-passive movement with pronation and supination from 5<sup>th</sup> week.
- 4-active flexion extension from 4<sup>th</sup> post-operative week.
- 5-active rotation movement start from 8<sup>th</sup> post-operative week.

### ***Results***

By post-operative physiotherapeutic plan there was gradual increase in the range of motion of the elbow joint.

- A-3 month after surgery. Extension - flexion 0-0-130  
Supination - pronation 30-0-45.
- B-6 month after surgery. Extension-flexion 0-0-140  
Supination-pronation 50-0-70
- C-12 month after surgery : Extesnion-Flexion 5-0-145  
Supination - pronation 70-0-90

### **Case Report 2**

Male patient 39 years old, fall down on the left hand with extended elbow joint while playing football (3.Nov.2017)

He had severe pain, limitation of movement in elbow joint specially rotation and progressive swelling, In Emergency Department Clinical Examination reveals suspect of Elbow Joint injury and shoulder dislocation, After X-ray it shows no dislocation of the Elbow joint, but multi fragment radius head fracture. posterior dislocation of the shoulder joint. For pre-operative plan, CT Done it show multi fragment displaced radius head fracture Maisson III,IV. Fig (c-d)



*Figure: c*

*Figure: d*

### ***Clinical Examination***

left Elbow, Diffuse swelling, Hämatom on lateral side of the elbow, tenderness over proximal forearm,

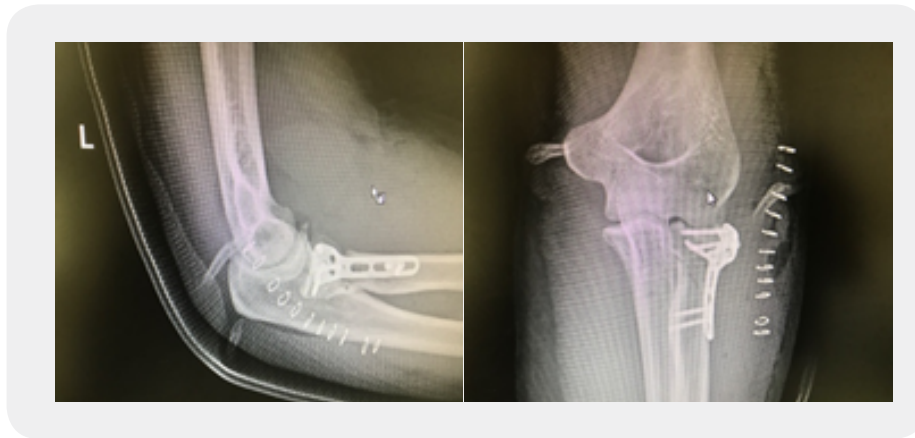
Movement; Extension - Flexion 0-60-80  
Supination - Pronation 0-10.40

**Treatment**

Reposition of the dislocated Shoulder under short anesthesia.

1<sup>st</sup>: Joint stabilization with above elbow Slap, ice therapy, Arm sling.

2<sup>nd</sup>: Surgical Treatment with ORIF, (Open reduction and internal fixation with Radial head form Plate) Fig (3-4)



**Figure: 3**

**Figure: 4**

**Material Used:** LCP Proximal radius plate 2.4 right, 4 Locking screws 2.4mm, and 1 cortical screws 1.5mm, 2 compression screws 2.4mm.

**Post-Operative Phase**

- 1-above elbow slap for 2 weeks.
- 2-passive movement of elbow flexion and extension. No rotation for next 2 weeks.
- 3-passive movement with pronation and supination from 5<sup>th</sup> week.
- 4-active flexion extension from 4<sup>th</sup> post-operative week.
- 5-active rotation movement start from 8<sup>th</sup> post-operative week.

**Results**

By post-operative physiotherapeutic plan there was gradual increase in the range of motion of the left elbow joint.

- A-3 month after surgery. Extension - flexion 0-0-110  
 Supination - pronation 20-0-45.
- B-6 month after surgery. Extension-flexion 0-0-120  
 Supination-pronation 30-0-60



## Discussion

The radial head fracture represents 2 to 6% of all fractures and is seen in one third of trauma [5], it is an injury to young adults because of the fragility of this area at this age and because of exposure to violent trauma [6-8]. The mechanism of injury is often indirect, by falling on the palm of the hand [5,9,10]. The direct mechanism is less common ranging from 13 to 42% [11,12]. Its diagnosis is clinical and radiological. The aim of treatment of the radial head fractures is the retrieval of a mobile, painless, and stable joint. It must in any case allow early mobilization. Orthopedic treatment with early mobilization remains the essential treatment for little or no displaced fractures. The duration of immobilization is ten days and should be extended to three weeks, if the medial collateral ligament damage was associated [13,14]. We confirm the good outcomes of orthopedic treatment in fractures type I. The treatment of complex fractures has evolved over the past two decades, including the radial head resection, surgical fixation or radial head replacement. The treatment of concomitants injuries including ligaments, bones and joints remains necessary in the management of these fractures.

Since the advent of adapted equipment, the surgical fixation results Middling results Bad results is a good treatment modality providing satisfactory outcomes. Miniaturization and reliability of the equipment have increased the performance of the osteosynthesis, which has contributed to decrease the indications of the radial head resection [15]. The surgical fixation is now the technique of choice in the treatment of Mason type II radial head fracture, especially as the development of the radial head resection is not without complications, in case of concomitant damages of elbow, forearm or wrist. In the Mason Type II fractures, a fragment of the radial head is still attached to the radial collar and serves to support for reconstruction of the separated fragments [15]. The surgical fixation is more difficult in comminuted fractures type III of Mason and the quality of the results is reduced by the association of capsular and ligament injuries of the elbow. The osteosynthesis must allow the closest possible anatomical reconstruction of the radial head and must restore both the radio-humeral and radio-ulnar congruence. The conservative attitude leads to satisfactory outcomes as shown by the majority of studies [6,11,15]. The inconveniences observed in the long term after radial head resection has led to the use of interposition implants in order to maintain the length of the radius. New implants are currently proposed. They fall into two categories: floating cup implants and fixed cup implants. Their biocompatibility and mechanical properties are satisfactory, but a risk of long-term deterioration is not excluded. Their high cost is a barrier to their use. The indications for arthroplasty are rare. The prosthesis will be used when there are associated with destabilizing injuries at the elbow, forearm or wrist and 93 whenever conservative methods are not feasible. Thus the radial head or prosthetic replacement is necessary to accomplish the proper functioning of forearm [16].

prosthesis has problems of aging, looseness and wear. Because this technique has only been in use clinically for a relatively short time, there is no information about durability [17] The analysis of different series, found very good results for Mason type I and II fractures [18] by against, for Mason type III fractures, the prognosis is less good and requires resection of the radial head more or less arthroplasty [10]. These results are also influenced by the time limit for management [19], the anatomopathological type, the presence of associated injuries [6,11,19,20], and the type of treatment [21,22].

## Conclusion

Important role of the radial head in the elbow joint and stability of the forearm have aroused greater attention. Significant changes have taken place in the treatment of radial head fractures. All treatment modality discussed provide satisfactory outcomes for patients in the majority of cases at short term follow-up.

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