

## The Unfortunate Elbow Triad (TMC) About 12 Cases

El Mehdi Ouissaden\*, Issa fathi, Reda allah bassir, Moncef Bouftal, Kharmaz Mohamed, Moulay Omar Lamrani, Ahmed El Bardouni, Mustapha Mahfoud, ET Mohamed Saleh Berrada

Department of Orthopedic Surgery, Ibn Sina Hospital, University Mohamed V, Rabat, Morocco

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\*Corresponding author: El Mehdi Ouissaden

### Abstract

### Original Research Article

Patient of 34 years who presented for 2 years a pelvic chondrosarcoma grade I (right shutter frame) with endopelvic extension and intimate contact with the nervous vascular pedicle and in whom a surgical carcinological exeresis was indicated with good Evolution Clinical and radiological.

**Keywords:** Chondrosarcoma, pelvic, surgical carcinological, exeresis.

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## INTRODUCTION

The unfortunate elbow triad (TMC) described by Hotchkiss, is a serious trauma associating a posterior dislocation, a fracture of the radial head and the coronoid process. His care is not codified in the literature, not very verbose about it. The aims of this work were to retrospectively analyze the results of a single-center series and to justify our surgical repair scheme.

## MATERIAL AND METHOD

It is a retrospective study with a series of 12 patients, presenting an unfortunate elbow triad, supported in first intention, at the P32 trauma-orthopedics ward, Chu Ibn Rochd of Casablanca, over a period of six years between 2011 and 2017, with a mean decline of 38 months. The average age of the patients was 42 years (24-64 years), divided into 9 men and 3 women. The initial trauma occurred in a road accident in six cases, a fall from a high place in four cases and a sports accident two cases. No cutaneous or vasculonervous complication was noted.

Fractures of the radial head were classified according to Masson's classification. Fractures of the coronoid process were classified according to the Morrey-Regan classification. And the functional results were evaluated according to the Mayo Elbow Performance Score (MEPS).

## RESULTS

All patients received a standard x-ray of the face and profile taking the above and underlying joints (Fig. 1), associated with CT in 11 cases (Fig. 2). Dislocation of the elbow was posterolateral in all cases. Fractures of the radial head were classified as type I in one case, type II in five cases and type III in six cases. Coronoid fractures were of type I in eight cases, type II in three cases and type III in one case.

Surgical treatment was performed urgently in all patients. After reduction of the dislocation of the elbow by external maneuver under scopic control and assessment of the stability, the stabilization was made by lateral approach of the elbow. The radial head was osteosynthesized in nine cases. The synthesis was carried out by mini screws in most cases (FIG. 3). In 5 cases of non-osteosynthesizable fractures, resection of the radial head was indicated. The synthesis of the coronoid process was carried out in two cases by an osteosuture. Postoperatively the elbow was immobilized by a splint holding the elbow at 90 ° flexion for 21 days. The flexion-extension and pronosupination rehabilitation was started directly after removal of the splint with full mobilization at the sixth week. A muscle strengthening program was then performed from the third posttraumatic month to strengthen the stabilizing role of the periarticular muscles.

After an average decline of 30 months. no complications were found with elbow instability or residual pain. The Mayo Elbow Performance Average

Score was 80 points (72-98), with an excellent result in five cases, good in six cases, and bad in one case. The average flexion obtained was 118° (90 to 130°). The average extension found was a deficit of 22° (0 to 50° deficit). The average pronation was 75° (35 and 80°) and supination 60° (30 and 70°). All patients had an elbow centered on radiographs, with a joint nip in one case.



**Fig-1:** Standard radiograph showing a terrible elbow triad with a type III fracture of the radial head and a type II fracture of the coronoid process



**Fig-2:** CT image showing a triad terrible of the elbow, objectifying the comminution of the fracture of the head and size of the apophysis fragment coronoid



**Fig-3:** Intraoperative scopic control of the reduction of the elbow and osteosynthesis of the radial head

## DISCUSSION

Described by Hochkiss in 1996 [1], The Terrible Triad of elbow is a rare entity representing only 10% of fractures of the radial head according to Van Riet and Morrey[4]. This lesion association represents a Complex trauma of the elbow that poses a problem diagnostic and therapeutic, and leads to lesions Bone and ligament threatening elbow stability at a cost

and in the long term, with a high rate of complications and random results. Surgical treatment of the terrible triads of the elbow requires a complete repair of the structures stabilizing bone (radial head and process coronoid) and ligamentous. The goal being restoration of the integrity and stability of ulnohumeral and radiohumeral joints, and their reduction, allowing postoperative mobilization early to limit flexionextension contractures [5,6]. In addition to standard radiographs, a balancé sheet scanograph should be the rule after reduction of laluxation to evaluate different bone lesions and guide the therapeutic strategy [3]. Several authors advocate the systematic reconstruction of the head radial, coronoid process and ligament plane lateral to limit complications [7]. In our series, three radial heads were resected: two partial resections, without consequence for stability and total resection resulting in instability secondary. The radial head represents an important element of stability in forced valgus and posterior translation. Thus, radial head fractures of type II and in the limits of possible type III fractures should be preserved and synthesized. However, in fractures non-synthesizable comminutives, the replacement prosthetic makes it possible to reconstruct the column of lateral stability [8]. Collateral ligament rupture medial, common in dislocation of the elbow, gives the radial head an important stabilizing role [9]. So, The Resection of the radial head alone is contraindicated in the context of the terrible triad because it increases the risk instability in valgus of the elbow and osteoarthritis severe [10]. According to Morrey [11], the coronoid process is the key element of the stability of the humeroular joint. 50% of the height of the coronoid process is necessary to ensure sagittal stability. Fixation small fragments of the coronoid process remain controversial. Terada [12] advocates a fixation systematic to achieve anatomical reduction and restore the stability of the anterior column. Some authors advocate capsular reinsertion by anchor, or a retrograde lacing supported on the olecranon. The Type II and III fractures require osteosynthesis stable by screw or plate [13]. McKee *et al.* [14] found a ligament injury collateral radial in all cases. This ligament being isometric, careful reintegration at the level of center of rotation of the elbow, centrally located the lateral epicondyle, is necessary to avoid instability in varus or posterolateral. Pugh *et al.* advocate systematic approach lateral approach, with osteosynthesis or replacement of radial head. The anterior column is repaired either by suture of the anterior capsule, either by fixation of the coronoid process. The radial collateral ligament must be repaired systematically. The decision to realize a first medial with repair of the collateral ligament internally is taken only in case of sagittal instability persistent. If the elbow is still unstable after a adequate treatment setting up a fixator external elbow is required. Whatever the type of surgical treatment used, the goal is to maintain congruent concomitant humero-ulnar,

radioulnar and radiocapital joints and to allow around the center of anatomical rotation of the elbow.

## CONCLUSION

The difficulty of this pathology lies in the surgical strategy. The lateral approach allows the recovery of the lateral stability column by osteosynthesis or arthroplasty of the radial head and reinsertion of lateral collateral ligament complex. A second medial approach is justified in cases of coronoid fracture type 2 or 3, or in cases of persistent intraoperative valgus laxity after the first lateral beat.

### Conflicts of interest

The authors do not declare any conflict of interest.

### Contributions of the authors

All authors have read and approved the final version of the manuscript.

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