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The Unfortunate Triad of the Elbow: About 5 Cases and Review of the Literature

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Abstract **Original Research Article**

The unfortunate elbow triad is a severe trauma involving posterior elbow dislocation, fracture of the radial head and coronoid process. Its management is not codified in the literature. We report a retrospective series of 5 patients treated at the Traumato-Orthopedics department of the CHU Ibn Sina in Rabat, over a period of 7 months from May 2021 to December 2021, the objective being to carry out a diagnostic and therapeutic analysis. Both patients had a stable but nevertheless very painful elbow. The unfortunate elbow triad leads to bone and ligament damage threatening short- and long-term elbow stability, with a high rate of complications and random outcomes. Only the restoration of the integrity of the elbow by repairing all the structures, using a standardized surgical protocol allows good functional results.

Keywords: Elbow-Dislocation-Coronoid-Fracture-Emergency.

INTRODUCTION

The Unfortunate Elbow Triad described by Hotchkiss, is a serious trauma associating a posterior dislocation, fracture of the radial head and coronoid process. It is a complex lesion with damage to the various elements of bone stability and ligament of the elbow, with a risk of primary and secondary instability. The main objective in the management of this type of lesions is the restoration of these bone elements and capsulo-ligaments of elbow stability. However, recognition of these lesions is difficult and the quality of emergency care will condition the final prognosis. The aim of this work was to retrospectively analyze the results of a series of five patients, specify the diagnostic and therapeutic elements, and to assess the quality of results.

MATERIALS AND METHODS

It is a retrospective study on 5 patients, presenting an unfortunate triad of the elbow, taken care of in first intention at the Traumato-Orthopedics department of Chu Ibn Sina in Rabat, over a period of 7 months between May 2021 and December 2021. The average age of the patients, who were all males, was 42 years (32-52 years). The initial trauma had occurred in the context of a public road accident in all the cases. No cutaneous or neurovascular complications were noted. Radial head fractures were classified according to the Masson classification. Coronoid process fractures were classified according to the Morrey-Regan classification and functional results were assessed according to the Mayo Elbow Performance Score.

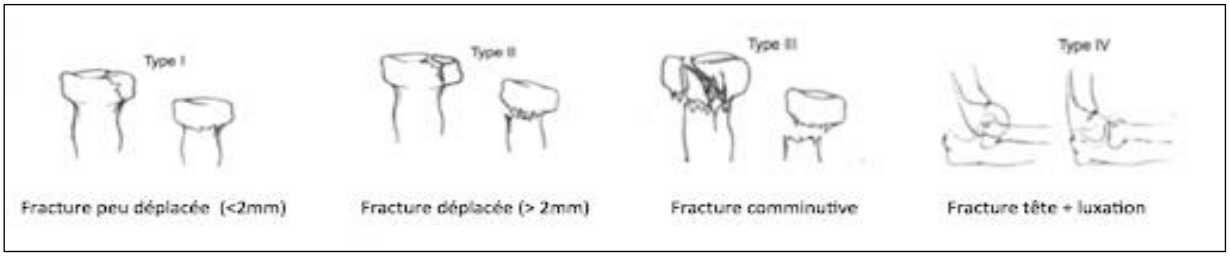

Figure 1: Mason classification

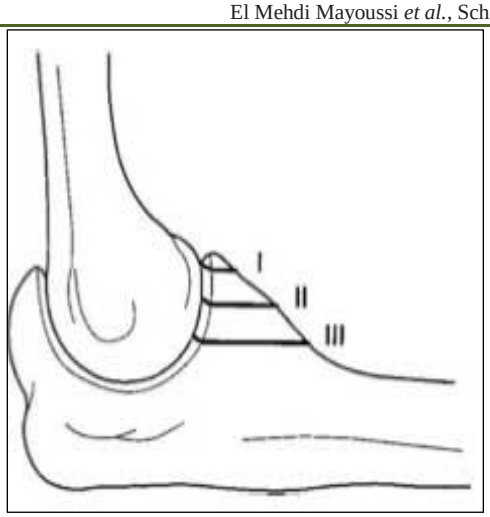

Figure 2: Coronoïde apophyse fracture

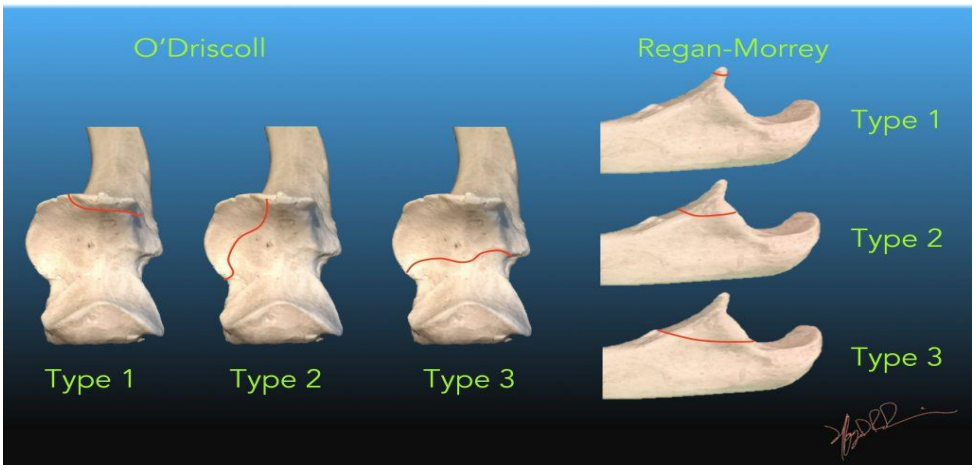

Figure 3: Regan-Morrey classification for coronoïde apophyse fracture

RESULTS

All the patients benefited from a standard X-ray of face and profile taking the above and underlying joints associated with a CT scan. The elbow dislocation was posterolateral in all the cases. The radial head fractures were both classified as stage 2 according to Mason. Coronoid fractures were type 2. Surgical treatment was performed urgently in all patients. After reduction of the dislocation of the elbow by external maneuver under sedation and scopic control and evaluation of the stability, the stabilization was made by first lateral approach of the elbow associated with a medial approach (Padlocks way). The radial head was osteosynthesized with Herbert screws in both cases. Synthesis of the coronoid process was performed in both cases by compression screwing. Ligament tears were repaired with transosseous sutures.

Postoperatively, the elbow was immobilized with a splint maintaining the elbow at 90◦ flexion, for 21 days. Rehabilitation in flexion-extension and pronosupination was started directly after removal of the splint with total mobilization at the sixth week. A muscle strengthening program has also been recommended by physiotherapists. With an average follow-up of 30 months. A complication as a secondary instability was noted, it was a type III fracture of the radial head in a patient of 49 years old who underwent a resection. Of the five patients, 4 had a stable elbow, i.e. 80% of cases, and 60% had little or no pain. Mayo Elbow Average Performance Score was 82 points (72-98), with an excellent result in 3 cases, good in one case and bad in one case. The average bending obtained was 118◦ (90 to 130◦). The average extension found had a deficit of 22◦ (0 to 50◦ of deficit). There average pronation was 75◦ (35 and 80◦) and the supination of 60◦ (30 and 70◦). The worst results corresponded to Mason 3 fractures of the radial head. All patients had an elbow centered on the x-rays, with joint narrowing in one case.

Figure 4: Elbow dislocation

Figure 5: Radial head osteosynthesis

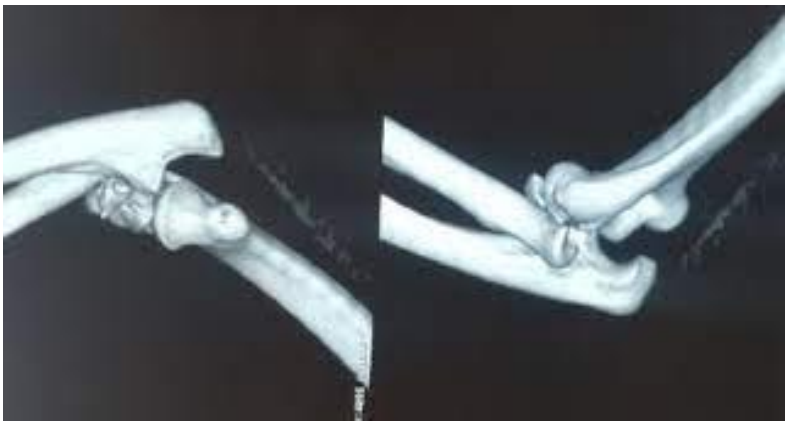

Figure 6: Tomography of the Terrible Triad

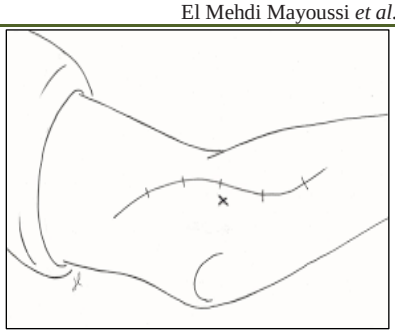

Figure 7: Cadenas surgical approach

DISCUSSION

Described by Hochkiss in 1996, the terrible elbow triad is a rare entity representing only 10% of radial head fractures. This lesional association represents a complex trauma to the elbow which poses a diagnostic and therapeutic problem, and leads to bone and ligament lesions threatening the stability of the elbow in the short and long term, with a high rate of complications and random results. The surgical treatment of the terrible triads of the elbow requires complete repair of the stabilizing bone structures (radial head and coronoid process) and ligaments. The objective is to restore the integrity and stability of the ulnohumeral and radiohumeral joints, and their reduction, allowing early postoperative mobilization. Alongside standard X-rays, a scannographic assessment should be the rule after reduction of the dislocation to assess the various bone lesions and guide the therapeutic strategy. Several authors recommend the systematic reconstruction of the radial head, the coronoid process and the lateral ligament plane to limit complications. The radial head represents an important element of stability in forced valgus and in posterior translation. Thus, type II radial head fractures and, as far as possible, type III fractures must be preserved and osteosynthesised.

CONCLUSION

The management of the terrible triad of the elbow remains a challenge for orthopedic surgeons. Only the restoration of the integrity of the elbow by repairing all structures, using a surgical protocol standardized allows good functional results.

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