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Isolated Dorsal Dislocation of the Distal Radioulnar Joint: A Rare Case in Athletes

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Abstract **Case Report**

Isolated dislocation of the distal radioulnar joint (DRUJ) is a rare injury. Poorly described in the literature, DRUIJ dislocations present a big challenge in terms of diagnosis and therapeutic approach. We present a case of a 22-year-old man athlete who sustained an isolated acute dorsal dislocation of the distal radioulnar joint during a football match. A reduction by external maneuvers was performed followed by transcutaneous radioulnar pinning and the patient was immobilized in an above elbow plaster cast for 6 weeks. After 6 months follow-up, results showed excellent functional recovery and a full regain of range of motion.

Keywords: Distal Radioulnar Joint-Volar Dislocation-Closed Reduction.

INTRODUCTION

Isolated acute distal radioulnar joint (DRUJ) dislocation is an uncommon injury [1]. Approximately 50% of isolated DRUJ dislocations are undiagnosed or diagnosed late with significant functional consequences [2].

Diagnosis with physical examination and traditional imaging may not be straight forward. Therefore a patient complaining of pain and swelling around the DRUJ as well as impossibility to rotate the forearm must raise suspicion for this infrequent kind of lesion.

We describe the rare case of an Isolated acute distal radioulnar joint (DRUJ) dislocation in a 22-year-old man.

CASE REPORT / CASE PRESENTATION

A 22 year-old right-handed man presented himself to our emergency department after an accidental fall whilst playing football. He complained of left sided persistent wrist pain and inability to rotate his hand with the palmar side up.

The patient had no previous medical or surgical history related to the injury, and had no previous injuries to the wrist, forearm or hand.

At physical examination, the wrist was swollen dorsally with a small hematoma located at the distal ulna. Supination was not restricted whereas pronation was impossible beyond the neutral position. There were no sensory or motor deficit and distal pulses were intact.

The X-ray revealed a dorsally located ulna in correlation to the radius. X-rays from the unaffected side were taken for comparison (shown in Fig. 1: *Volar dislocation on lateral radiograph compared to the uninjered side*). Anteroposterior and lateral radiographs showed no bone injury. Closed reduction was attempted in the Emergency department but was not successful.

The patient was admitted in the operating room where the dislocation was reduced closed under general anaesthesia with use of a commonly accepted maneuver of distraction of the distal radioulnar joint, direct pressure on the ulnar head, and passive pronation. The DRUJ was stabilized with two percutaneous Kirschner wires (shown in Fig. 2: *Postoperative X-rays*) followed by cast immobilization in full supination. After 6 weeks, cast and k wires were removed and progressive physiotherapy was initiated. At 6 months postoperatively, the patient's wrist was stable and had the same strength as his uninjured side. When reviewed 4 years after the injury, the patient remained asymptomatic with full pronation and supination of the forearm. He has a full time job as an operating room nurse and continues to play football.

Figure 1: Volar dislocation on lateral radiograph compared to the uninjered side

Figure 2: Postoperative X-rays

DISCUSSION

The distal radioulnar joint (DRUJ) is a diarthrodial, synovial articulation that plays an important role in the rotational movement of the forearm [3]. It allows pronation and supination which are essential for the function of the upper limb. However, it is unstable by nature. Since the radius of the curvature of the ulna is 50% smaller than the radius of the curvature of the radial notch, there is some room for translocation during rotation of the forearm [4]. During supination, the head of the ulna translates palmarly and during pronation dorsally. The radial notch is shallow and does not constrain the ulna during these movements [5]. The main stabilizer of the DRUJ is the triangular fibro cartilage complex (TFCC), originally described by Palmer and Werner. The TFCC is composed of several structures, including the triangularfibrocartilage (TFC), the ulnocarpal meniscus (meniscushomolog), the ulnar collateral ligament, the dorsal radioulnar ligament, the palmar radioulnar ligament, and the subsheath of theextensor carpi ulnaris (ECU) [6].

Desault was the first to describe a simple anterior dislocation of the distal end of the ulna in a cadaver in 1777. Since then, occasional cases have been reported [7, 9]. Dislocation is usually caused by indirect mechanism, which seems almost specific, and can be

analyzed in every detailed history as forced extreme supination on a fixed wrist.

The presentation in the acute case is characteristic. The forearm is painfully locked in full supination; the elbow moves freely and the radio-carpal joint and hand, less rotated than the forearm, show good mobility. Lateral displacement of the ulnar head gives the distal forearm a narrowed appearance, and the flexor tendons overlying the head add to the anterior prominence8. Nevertheless examination may show a partially reduced or even normal range of motion, also no evidence of deformity [9, 10].

Even if false negative results may occur, a standard lateral X-ray can confirm the diagnosis. It shows an overlap of radius and ulna at the DRUJ. This is done with the shoulder abducted 90 ° and the elbow at 90 ° flexion and neutral forearm rotation. Nakamura *et al.*, [11] showed that true lateral X-rays are able to detect DRUJ dislocation with almost the same sensitivity as a computed tomography (CT) scan. If the diagnosis is uncertain, it can be confirmed by further imaging like CT scan or Magnetic resonance imaging (MRI), which demonstrates any joint incongruence. Associated lesions can also be detected by these imaging procedures.

Acute dorsal distal radioulnar joint dislocations are routinely treated with closed reduction under Local anesthesia with or without sedation. Reduction is achieved, after full muscle relaxation, by manually applying pressure over the prominent ulnar head whilst pronating the forearm. Stability is tested. In our case, reduction was possible but the joint was instable. A percutaneous Kirschner wire is used to temporarily transfix the DRUJ in reduced position to allow soft tissue healing, followed by cast immobilization in full Supination.

If the dislocation proves to be irreducible, even with conscious sedation or general anesthesia, open reduction in combination with repair of the TFCC is recommended [12]. If instability persists, different reconstruction techniques have been described [4, 13].

CONCLUSION

Distal radioulnar joint (DRUJ) dislocation is a rare injury which can be easily missed or lately diagnosed, leading to significant morbidity. Proper lateral X-ray of the wrist is required for prompt detection. Early diagnosis and treatment of such injuries usually results in excellent functional recovery.

Statement of Ethics

The patient has provided written informed consent for the case to be used for publication purposes. The patient's identity is concealed throughout this paper. Ethical approval was not required and therefore not obtained as this was not a clinical trial.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

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DATA AVAILABILITY STATEMENT:

All data generated or analysed during this study are included in this article.

AUTHOR CONTRIBUTIONS

Dr Alae Neqrachi, had considerable contribution to the conception of the work, Moncif Boufettal, Rida-Allah Bassir, Mohamed kharmaz and Mohamed saleh Berrada had also a large contribution in the process of drafting the manuscript and approving the final version to be published.

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