



## Case report

## Case report: Isolated acute dorsal distal radioulnar joint (DRUJ) dislocation

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## ABSTRACT

**Introduction:** Isolated acute distal radioulnar joint (DRUJ) dislocation is a rare injury that should be early recognized and treated promptly to avoid the limitation and disability associated with delayed diagnosis and management.

**Case presentation:** We present a patient with a traumatic dorsal isolated DRUJ dislocation who was successfully treated with a closed reduction and k-wire pinning along with cast immobilization.

**Discussion:** Previous reports of distal radioulnar joint dislocation have described the mechanics of this injury as well as a guidance to diagnosis and treatment. Closed reduction, stabilization of wrist joint, and early mobilization of elbow joint can help in preserving the joint function and a faster recovery.

**Conclusion:** Closed reduction under general anesthesia, DRUJ stabilization by k-wire pinning, and above elbow casting can be successful in most cases. We recommend an early transition to below elbow cast to encourage early elbow range of motion and prevent joint stiffness.

## 1. Introduction

Isolated acute distal radioulnar joint (DRUJ) dislocation is an uncommon injury that can be easily missed due to subtle presentation and improper imaging. The dislocation can be dorsal (more common), or volar. High index of clinical suspicion is crucial for diagnosis and proper management. If left untreated, DRUJ dislocation can result in secondary instability and disability of the joint [1]. We present a case of an isolated traumatic right distal radio-ulnar joint dislocation in a 41-year old male who was managed with a closed reduction and k-wire stabilization. The outcome was satisfactory and the patient has regained a painless, normal range of joint motion.

## 2. Case presentation

This case follows 2020 SCARE guidelines for reporting of cases in surgery [2]. We describe a 41-year-old right-handed Middle Eastern male with no relevant past medical-surgical history, working as a pastry chef, who presented to our emergency department complaining of right wrist pain, swelling, and restricted wrist range of motion after falling down on his outstretched right hand at work. Initial evaluation of the

patient showed dorsal ulnar prominence with locked forearm in pronation, and limited wrist motion. There were no open wounds and the neurovascular examination was normal.

Lateral wrist x-ray revealed a dorsal dislocation of the ulna at distal radioulnar joint (DRUJ) without any bone injury (Fig. 1). At emergency department, closed reduction under conscious sedation was done by supinating the hand and applying an above elbow cast. Post reduction CT-scan demonstrated residual DRUJ subluxation with no associated fractures (Fig. 2).

On the same day in operating room, the patient was managed by the author (S.T.D.) under general anesthesia with a closed reduction by direct pressure on ulnar head and fully supinating the forearm in 90-degree elbow flexion. The DRUJ was stabilized by percutaneous k-wire pinning in ulnar-radial direction. Post-operative imaging confirmed DRUJ reduction (Fig. 3). The joint was immobilized by above-elbow cast for 2-weeks, and then was changed to below-elbow cast for 4-weeks to encourage elbow motion. K-wire was removed 6-weeks post-operatively, and examination under fluoroscopy revealed a stable DRUJ (Fig. 4). Physiotherapy was planned, however, the patient didn't comply with post-operative rehabilitation. Eight months after surgery, patient attended our clinic for another medical complaint, and was

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Fig. 1. Right wrist X-ray at initial presentation: (A) Lateral view: shows dorsally displaced ulnar head. (B): Anteroposterior view: shows minimal diastasis of the joint.

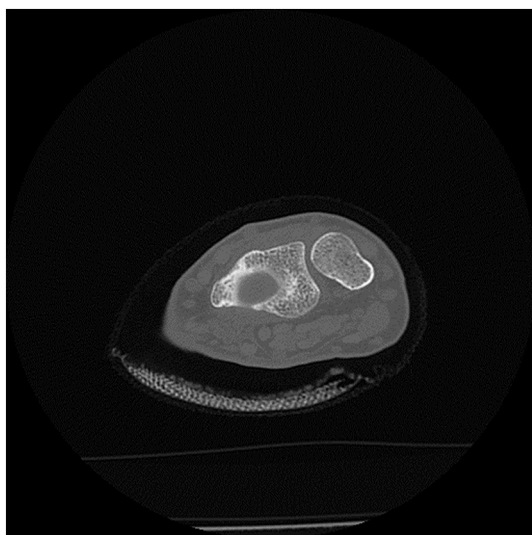


Fig. 2. Wrist CT post closed reduction at ER shows residual DRUJ subluxation.

found to have a painless, normal range of motion at wrist and elbow joints, and no restriction in work related activities (Fig. 5). His wrist was stable, and of normal hand grip power compared with his uninjured extremity (DASH Score: 0/100), and was very satisfied with the management outcome.

### 3. Discussion

The distal radioulnar joint is formed by the articulation between the concave sigmoid notch of the distal radius and the convex articular surface of the distal ulna, and the supporting capsuloligamentous structures. The joint is responsible for the pronation- supination movement of the forearm [3]. The smaller arch of the ulnar head compared with the arch of the sigmoid notch of the radius also allow for some degree of volar-dorsal translation of the ulna during rotation [4].

The stability of the joint is mainly enhanced by the triangular fibrocartilagenous complex (TFCC) which consists of: the triangular fibrocartilage (TFC), the ulnocarpal meniscus (meniscus homolog), the

ulnar collateral ligament, the dorsal radioulnar ligament, the palmar radioulnar ligament, and the subsheath of the extensor carpi ulnaris (ECU) [1].

Isolated dislocation of the DRUJ is uncommon, and usually associated with a fracture. Depending on the mechanism of the injury; the dislocation can be volar or dorsal. In dorsal dislocation, there is a hyperpronation force which is usually due to a fall on an outstretched hand, as in our case. In contrast, volar dislocations occur due to hypersupination forces [5].

The diagnosis of dorsal DRUJ dislocation should be suspected based on the clinical history and physical examination. Patients usually present with painful wrists, limited supination, or locked pronation. There may be also a prominent ulnar head dorsally. The diagnosis can then be confirmed by radiographic examination on posteroanterior wrist X-ray which may show DRUJ widening with divergence of the radius and ulna, while on the lateral view, the ulnar head will be prominent dorsally. Further imaging with CT scans can be done if there is suspicion of DRUJ injury and is beneficial in evaluating the joint congruity. MRI might be needed to assess for soft tissue injuries [6].

The standard treatment described in the literature involve closed reduction under local or general anesthesia followed by immobilization in the position of greatest stability by above elbow cast for 6- weeks duration. In a dorsal dislocation, this is accomplished by gentle traction with direct dorsal pressure on ulnar head and fully supinating the forearm in 90-degree elbow flexion and held by above elbow cast for 6-weeks. The joint must be assessed for instability and if shown to be unstable, it should be stabilized by radioulnar pinning using K-wires. In our case, we decided to change from above to below elbow cast after 2-weeks to encourage elbow range of motion, prevent joint stiffness, and speed up functional recovery. In case of complex dislocations, closed reduction can be impossible due interposition of tendons, which may necessitate open reduction and repairing the TFCC [7,8].

### 4. Conclusion

Although isolated DRUJ dislocation is a rare injury, it should be treated properly and in a timely manner to reduce the risk of disability associated with delayed treatment. High index of clinical suspicion and proper imaging is required for early detection. We recommend early elbow motion to avoid stiffness and shorten recovery time.

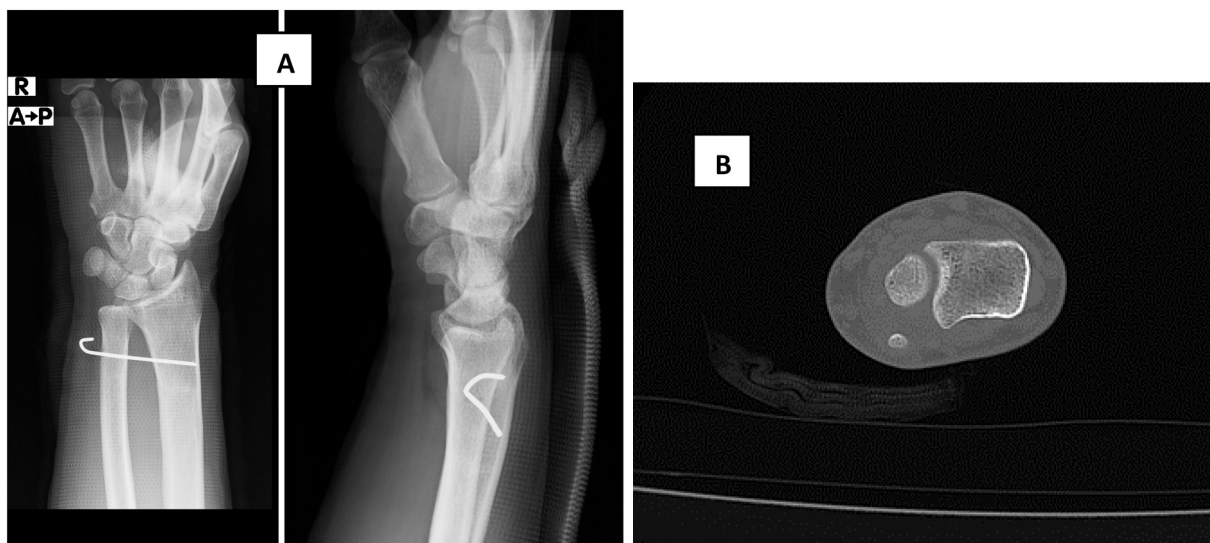


Fig. 3. (A): Post-operative wrist X-ray shows reduced DRUJ held by K-wire in ulnar-radial direction. (B): Post-operative wrist CT shows reduced DRUJ.



Fig. 4. Wrist X-ray post K-wire removal (6 weeks post-operative) shows reduced DRUJ: (A) lateral view. (B) Anteroposterior view.

**Provenance and peer review**

Not commissioned, externally peer-reviewed.

**Consent**

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

**Ethical approval**

Ethical approval for this case report has been exempted by our institution.

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**Guarantor**

Dr. Salah Tewfik Daradkeh.



Fig. 5. Final clinical result: (A) full supination. (B) Full pronation. (C) Full elbow extension. (D) Full elbow flexion.

#### Research registration number

Not applicable.

#### CRediT authorship contribution statement

**Salah Tewfik Daradkeh:** study design, data collection, data analysis, conceptualization, and writing the paper

**Basel Elayan:** data analysis, conceptualization, and writing the paper

**Yazan Tawfiq Daradkeh:** writing the paper

**Firas Salman Al Dabouby:** reviewing the paper.

#### Declaration of competing interest

We report no conflicts of interest.

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