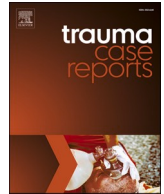




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Acute isolated dislocation of the distal radial ulnar joint – ulnar volar with no other associated lesion: Case report and review of the literature

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ABSTRACT

Isolated dislocation of the distal radioulnar joint is a rare phenomenon with few described cases in the literature for which the management is not well established. We report here a case of distal radioulnar joint dislocation – ulnar volar. The patient is a 58-year-old woman who fell on an extended upper extremity with forced supination. The patient was treated non-surgically with closed reduction and immobilization followed by physical and ergonomic therapy. During treatment MRI imaging was performed which showed no lesion to the TFCC. Following immobilization, the patient had good mobility of the forearm and the wrist. Early diagnosis, treatment, and imaging allowed for excellent functional recovery without surgical treatment.

Background

Traumatic dislocation of the distal radioulnar joint (DRUJ), both dorsal and volar, is a rare injury often associated with other lesions such as fractures of the radius and ulna [1]. In addition, DRUJ dislocations are associated with lesions of the Triangular Fibrocartilage Complex (TFCC) [2]. This type of lesion results from a fall on the extended arm with forced supination upon landing. The literature has put emphasis on early diagnosis and treatment because of poor functional outcomes that result from a delayed diagnosis [3].

In this paper, we report the case of early diagnosis and treatment of an acute isolated volar dislocation of the ulna at the distal radioulnar joint with no other associated lesion.

Case presentation

A 58-year-old, right-handed woman sustained an injury whilst slipping in her bathtub when she landed on her extended right arm with the wrist in extension and a forced supination upon landing. Following the fall, the patient came to the emergency department for a consultation due to deformity, pain and functional impairment of the right wrist and forearm. Upon arrival, the physical examination revealed a volar deformity and tenderness on palpation of the volar aspect of the wrist with a palpable gutter at the level of the ulnar head. There was no sensory loss nor skin lesion. X-rays revealed a volar dislocation of the ulna at the distal radioulnar joint (Fig. 1a and b). Full forearm and elbow anteroposterior and lateral X-rays showed no associated fracture. The dislocation was reduced under Analgesia/Sedation using traction and manually applying pressure over the prominent volar ulnar head whilst pronating the forearm.

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Fig. 1. a) Anteroposterior view of the right wrist. b) Lateral view of the right wrist. c) Anteroposterior view of the right wrist after reduction. d) Lateral view of the right wrist after reduction.

Post-reduction x-rays showed no fracture and good articular congruence (Fig. 1c and d). Full forearm and elbow anteroposterior and lateral X-rays showed no associated fracture (Fig. 2). Testing of the distal radioulnar joint under sedation did not show laxity in supination, neutral or pronation position. A long arm cast was applied in a neutral position of the wrist at 90° of elbow flexion in a long arm plaster-of-Paris. There was no sensory or motor loss after the reduction. The patient underwent an MRI of the right wrist 3 weeks after the injury that showed a sub-millimetric tear of the central portion of the TFCC with no musculoskeletal, ligamentous, nervous, vascular or other lesions (Fig. 3). Immobilization was kept for 6 weeks. At 1-month follow-up, a physical exam of the wrist showed residual pain on the volar aspect of the ulna, 70° of active flexion and 40° of active extension with 70° of active pronation and 70° of active supination. No sensory or vascular deficit was seen at 1-month follow-up. The long arm cast was removed at 6 weeks and ergotherapy were initiated.

At 6 weeks follow-up, active range of motion values between the right (trauma) and the left (healthy) wrist were respectively, flexion 66° vs 76°, extension 60° vs 62°, supination 88° vs 90°, and pronation 86° vs 90° (Table 1). Jamar strength between the right and the left hand showed no significant clinical difference (right 20.3 kg, left 19 kg).

At 12 weeks follow-up the patient presented with full range of motion on both sides with pronation 90° (Fig. 4a), supination 90° (Fig. 4b), extension (Fig. 4c) and flexion both at 90° (Fig. 4d).

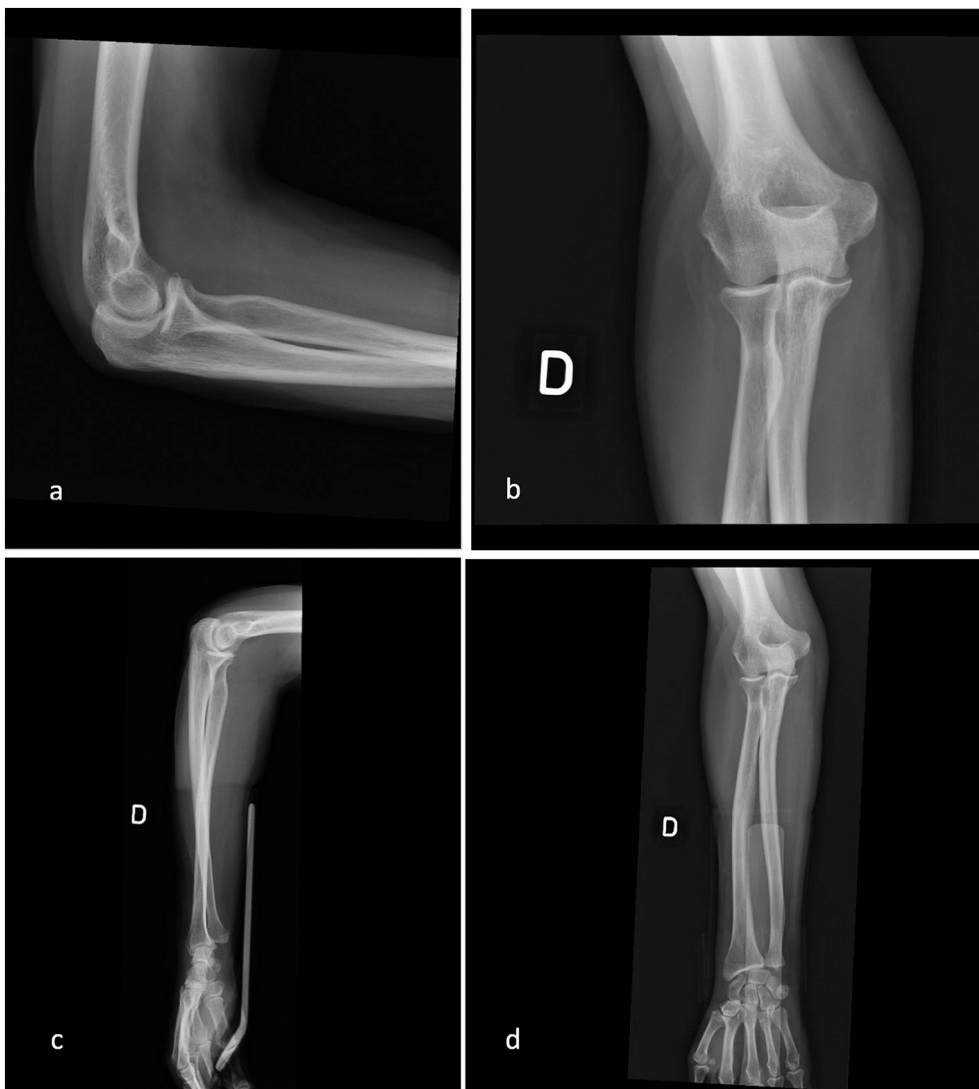


Fig. 2. a) and b) Anteroposterior and lateral views of the right elbow, showing no lesion. c) and d) Anteroposterior and lateral views of the right forearm, showing the distal radioulnar dislocation, with no other lesions associated.

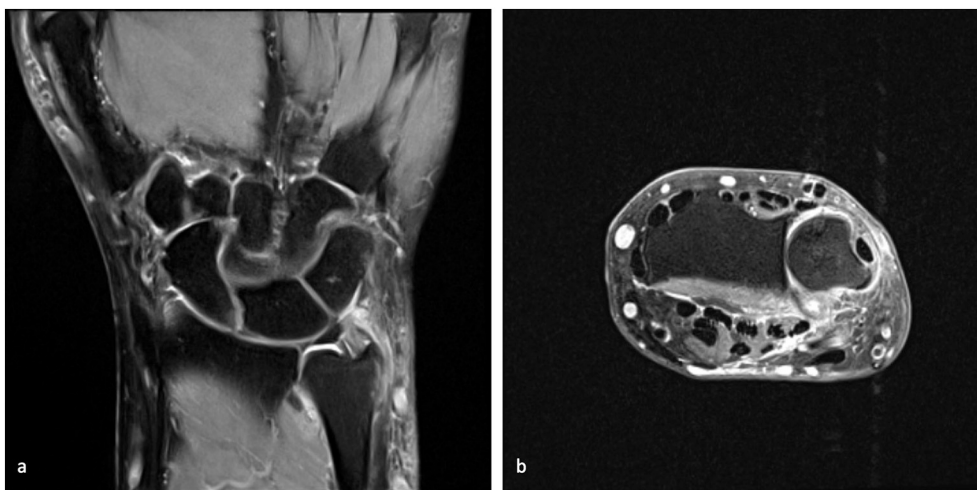


Fig. 3. a) Coronal view of the TFCC showing no lesion. b) Axial view of the TFCC showing no lesion and good radio-ulnar congruity.

Table 1

Right wrist range of motion measurements, in degrees, at 4, 6 and 12 weeks follow-up.

Right wrist functional recovery				
Time from injury	Flexion	Extension	Pronation	Supination
4 weeks	70°	40°	70°	70°
6 weeks	66°	60°	86°	88°
12 weeks	90°	90°	90°	90°

Progression of functional recovery is shown in Table 1.

Discussion

Anterior dislocation of the distal end of the ulna was first described by Dessault in cadaveric dissection in 1777. Isolated dislocation of the distal radioulnar joint is a rare phenomenon, with the majority of cases being dorsal. In all dislocation cases the mechanism of injury is fall on an extended wrist in forced supination. Reduction is achieved counteracting the dislocating forces by pronating the forearm and applying pressure to the ulnar head under image intensifier verification, if available.

Early diagnosis is crucial in order to guarantee the best functional outcome for the patient. Standard anteroposterior and lateral radiographs are recommended for radiologic assessment, with the most crucial projection being a correctly executed and purely lateral radiograph. If a correct lateral radiograph is not possible due to pain or deformity, or in case of doubt [4] then a computed tomography scan is necessary to guarantee correct diagnosis. Few cases have been described in the literature with treatments varying from cast immobilization to surgical options ranging from percutaneous K-wire pinning, mini-suture anchors [4], to open reduction and internal fixation [3]. Surgical treatment is often necessary in cases of irreducibility or delayed diagnosis. The irreducibility is often due to soft tissue incarceration most notably the articular capsule and the TFCC. Weseley et al. [5] have described cases of chronic volar dislocation of the DRUJ that was treated with Darrach’s procedure with satisfactory outcome. In certain cases treatment delayed for up to 7 weeks was described in the literature with good functional outcomes post-treatment [1].

In cases of non-operative treatments, the literature recommends immobilization ranging from 3 to 6 weeks on the basis that 6 weeks is on average the time needed for TFCC and the eventual interosseous membrane lesions to heal [6].

In the case of our patient the MRI done at 3 weeks after the trauma shows showed a sub-millimetric tear of the central portion of the TFCC and no other lesions to the surrounding structures of the DRUJ, which did not require surgical intervention, explaining the stability that was found upon reduction of the dislocation. In the case where the joint should have been unstable, early surgical treatment would have been warranted.

Given the elements presented in the literature and the functional results of our patient it is therefore possible to treat these rare injuries non-surgically under the important condition that the DRUJ remain stable in pronation, neutral position and supination after reduction. Further research in description of cases is needed to better define the treatment strategy for these rare and potentially more impacting injuries (Fig. 4).



Fig. 4. Patient at 12 weeks follow-up showing a) complete and symmetrical pronation, b) complete and symmetrical supination as well as c) extension and d) flexion.

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Declaration of competing interest

The authors hereby declare no conflict of interest.

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