

Case Report

Volar Dislocation of the Distal Radioulnar Joint Associated with Ulnar Styloid Fracture: A Case Report

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Abstract

Volar dislocation of the distal radioulnar joint is a rare injury which is commonly missed in emergency departments. A detailed history, careful physical examination, proper radiographic imaging along with a high index of suspicion is required to diagnose these injuries. We report a case of a 33 year-old man who sustained an acute, volar dislocation of the distal radioulnar joint associated ulnar styloid fracture and highlight the important clinical and radiological features, which can help in timely recognition.

Key words: distal radioulnar joint, dislocation, styloid fracture

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Introduction

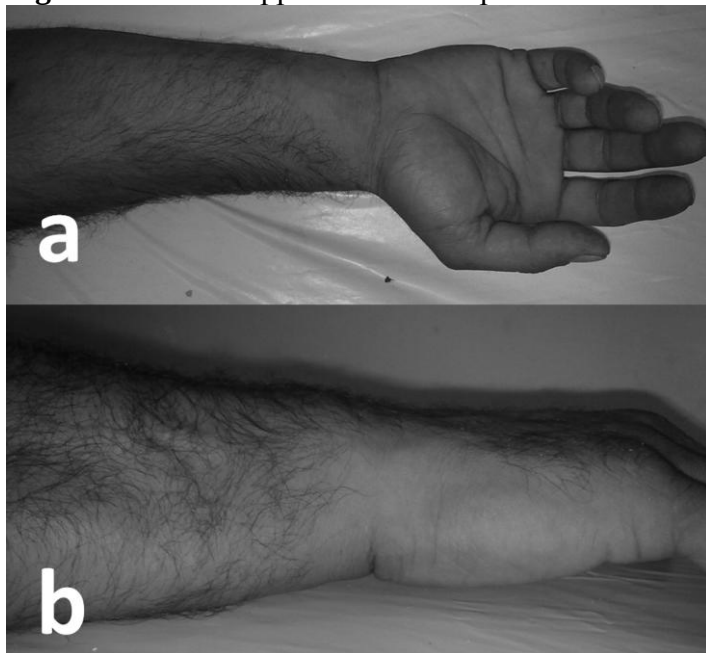
Dislocation of distal radioulnar joint (DRUJ) is usually associated with distal radius fractures [1]. However, isolated dislocations of the DRUJ are quite uncommon. There is little number of case reports or case series in relevant literature [2-7]. Isolated dislocations of DRUJ can be easily missed due to lack of evident clinical deformity and the difficulties in assessment of faulty positioned wrist radiographs at emergency department [8]. In delayed cases, complex surgical procedures are needed for reconstruction and possible loss of wrist function may occur [4]. Therefore, it is important to recognize these rare injuries at initial admission.

Herein, a case of DRUJ dislocation associated with ulnar styloid fracture is presented, and radiologic diagnosis, clinical findings and treatment methods are discussed.

Case report

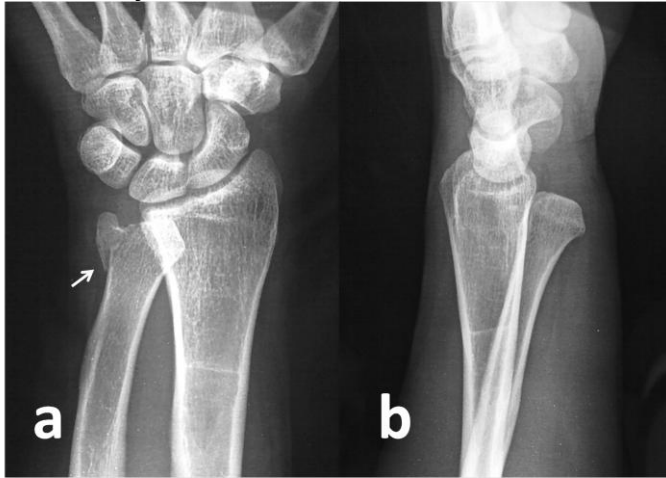
33 year-old male admitted to our emergency department with wrist pain. He stated that a car door was closed forcefully on his pronated right wrist. On physical examination, there was slight edema over the wrist without apparent deformity (**Figure 1**). Active and passive wrist movements could be done with only 10 degree of limitation on pronation. Neurovascular examination was normal.

Figure 1. Clinical appearance of the patient's wrist.



Wrist radiographs showed volar dislocation of DRUJ associated with ulnar styloid fracture (**Figure 2**).

Figure 2. (a) Anteroposterior and (b) lateral direct radiographs of the wrist. The arrow show the ulnar styloid fracture.



Under conscious sedation, closed reduction was attempted in ED. However, reduction could not be accomplished. Patient was brought to the operation theatre, and under general anesthesia closed reduction was performed with traction and applying pressure over the volar aspect of styloid process. After the reduction, there was joint instability with hyperpronation under fluoroscopic control. The radioulnar joint was fixed at reduced position with a Kirschner wire to ensure the stability (**Figure 3**). The styloid process fracture was reduced simultaneously after the reduction of DRUJ, and fixed with a K wire.

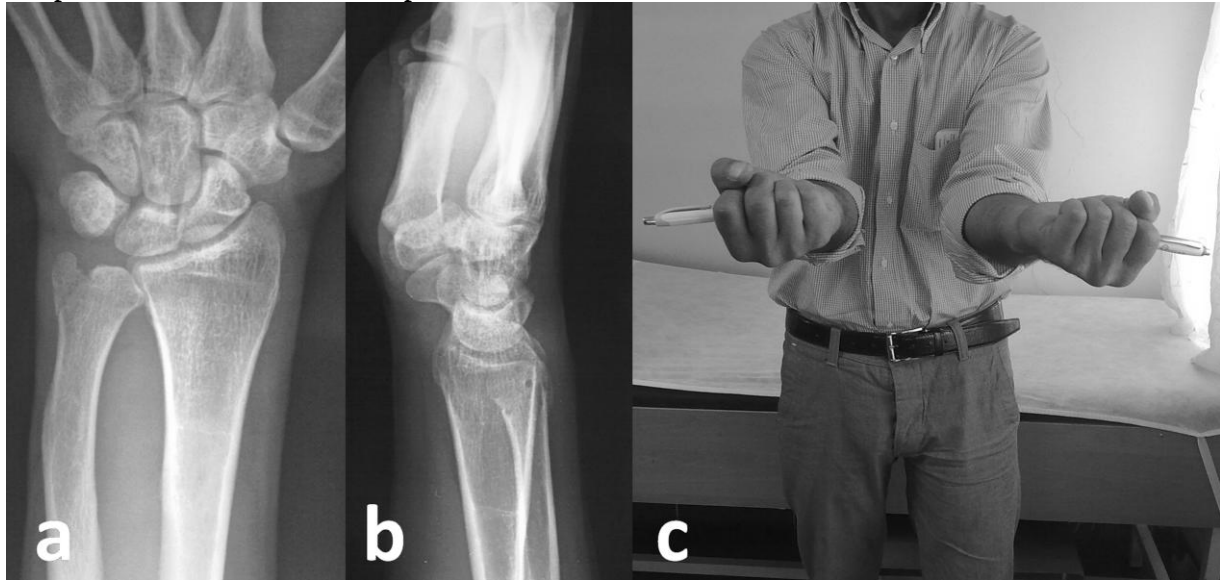
Figure 3. Post-operative radiographs showing the proper reduction and fixation of DRUJ.



A long arm plaster cast was applied on forearm in neutral position for 4 weeks. K wire that fixes the DRUJ was removed and the patient was allowed for active wrist joint movements at the postoperative 4th week. At postoperative 6th week, Kirschner wire of ulnar styloid process

was removed, and the patient was referred to the physical therapy program. At the final follow-up 3 months after the initial injury, patient was pain free with full range of wrist movements with normal radiographic findings (**Figure 4**). He returned to his previous level of activity and occupation.

Figure 4. (a) Anteroposterior and (b) lateral direct radiographs, and (c) clinical appearance of the patient at the final follow-up.



Discussion

Almost half of the DRUJ dislocations are not noticed at initial admission to emergency departments [9]. There are various reasons for failure of recognition. The first reason is the lack of clinically significant physical findings in this specific injury. Secondly, obtaining a true lateral wrist radiographs is difficult, and decision making using unstandardized radiographs lead to misdiagnosis. Finally, high index of suspicion is necessary to recognize these rare injuries.

The distal radioulnar dislocations are divided into two subtypes according to direction of ulnar displacement; namely volar and dorsal DRUJ dislocations [2]. Terminal arch of supination is lost in volar dislocations, whereas limitation of supination is seen with dorsal dislocations [2]. On the other hand, flexion and extension of wrist may be totally normal in both subtypes. Although, it is hard to identify the ulnar head due to edema, ulnar head may become more prominent compared to the uninjured wrist, either volarly or dorsally. Furthermore, ulnar nerve compression symptoms may be found in volar dislocations [5]. In the presented case,

the wrist flexion and extension was normal. The slight limitation of pronation was the single clinical finding. A careful examination is utmost important to detect these subtle clinical findings.

Anteroposterior (AP) and lateral wrist radiographs is a standart care of a patient with wrist trauma. On AP wrist radiograph, an ulnar styloid overlapping with radius and appears bigger than usual suggest volar dislocation. On the contrary, radioulnar separation and a smaller ulnar head suggest dorsal dislocation. On a standard lateral wrist radiograph, ulna is superimposed with radius and aligns with 3rd metacarpal base together with capitate and lunate bones [6]. Any deviation within this alignment suggests dislocation of DRUJ. However, obtaining a true lateral radiograph is difficult in most instances due to a painful extremity. CT is an alternative imaging modality to confirm suspicious findings [10]. Oblique radiographs do not provide sufficient information for the diagnosis. Therefore, physicians should not be satisfied with oblique radiographs.

Initially, closed reduction should be attempted in DRUJ dislocations, followed by immobilization of the wrist for 4-6 weeks. However, recurrent dislocation of DRUJ may develop after closed reduction alone [7]. The joint should be stabilized with percutaneous K wires in case of residual instability during post reduction examination. In patients in whom closed reduction is failed, open reduction and TFCC repair, if it is damaged, are suggested [8]. In general, the prognosis of DRUJ dislocations is excellent when recognized timely and treated properly.

As a conclusion, isolated DRUJ dislocations associated with styloid process fractures are rare injuries. Early recognition of these injuries necessitates detailed physical examination, properly taken radiographs and high index of suspicion.

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