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Case Report

Forearm floating with a terrible triad in the elbow after fall, case report[☆]

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ABSTRACT

Perilunate fracture dislocation with an elbow dislocation, it is referred to as a floating forearm. Very few cases have been described worldwide. We report a case of a 37-year-old man diagnosed with a floating forearm (trans-scaphoid perilunate fracture dislocation combined with a terrible triad injury), after a fall of the top of an olive tree. Urgent closed reduction of the elbow and wrist was obtained. A double approach to the wrist was used: dorsal approach to fix the scaphoid and to reduce the carpus and a volar approach to release the median nerve and repair the volar capsule. A lateral approach to the elbow was performed to fix the radial head and to repair the lateral collateral ligament. At 3 months postoperative, the patient had no pain in the elbow and in the wrist. He returned to Work with some restriction at 4-month post operatively.

Introduction

Perilunate fracture dislocation associated with elbow fracture dislocation is referred to as a floating forearm. This pattern of injury is rare and only a few cases have been reported in the literature. The elbow dislocation can be distracting injury and the perilunate injury can be overlooked. We report a case of a trans-scaphoid perilunate fracture-dislocation associated with an ipsilateral terrible triad.

Case report

A 37-year-old male, right-handed, with no previous medical history, fell from the top of an olive tree during harvesting and landed on his left arm in extension. He had significant elbow pain and deformity. Initially there were no complaints about the wrist or apparent deformity, however, a couple of hours later, a wrist deformity was also noted. He had no neurovascular deficits.

Image study showed a trans-scaphoid perilunate fracture-dislocation, with (a scaphoid fracture (Herbert type B2)) and an elbow terrible triad injury (fracture of the coronoid (Regan and Morrey I) and radial head fracture (Mason IV)). Therefore, the diagnosis of a

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Fig. 1. Forearm lateral radiography with posterolateral elbow and perilunar dislocation.

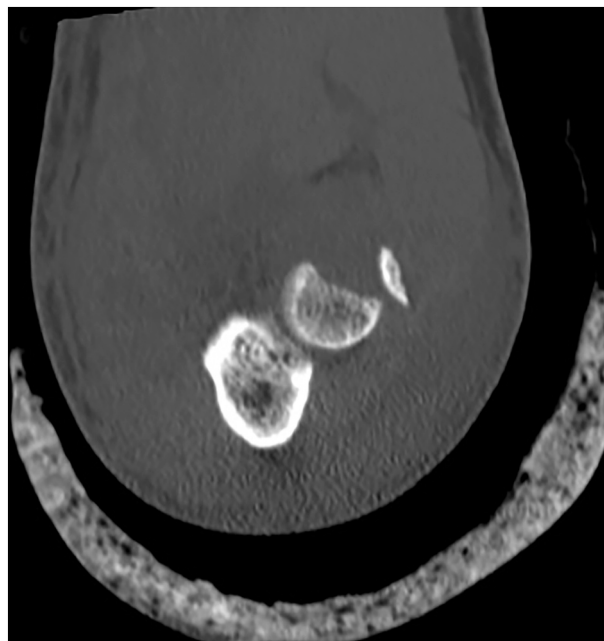


Fig. 2. Computed tomography in a coronal section of the elbow with radial head fracture.

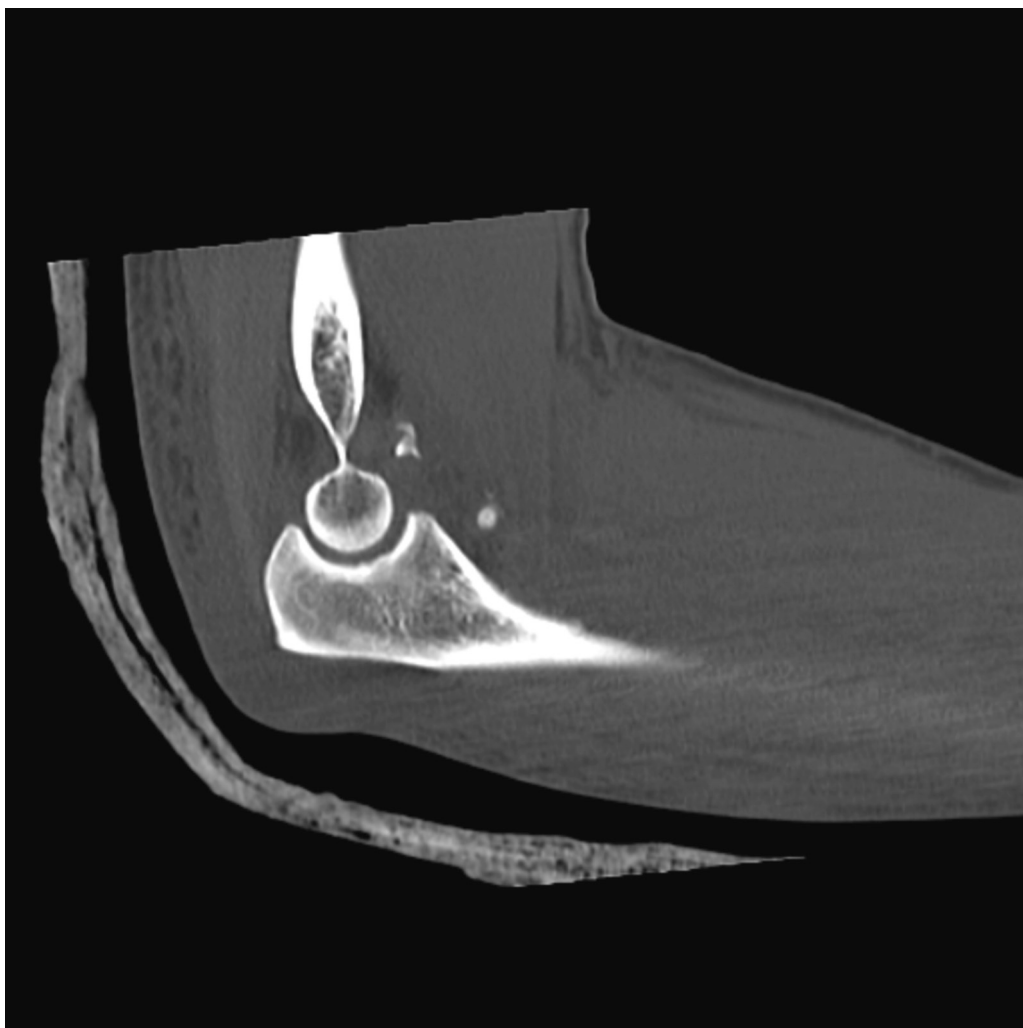


Fig. 3. Computed tomography in a sagittal section of the elbow with coronoid apophysis fracture.

floating forearm was assumed (Figs. 1, 2 and 3). Closed reduction of the elbow and the wrist was obtained and an above the elbow plaster splint was provisionally done.

Definitive surgery was performed on the next day. A dorsal approach to the wrist was performed. The scaphoid fracture was reduced and fixed with two 3.5 mm Herbert screws, the lunate was then reduced and fixed with a radiolunate K-wire. Additional carpal fixation was obtained with k-wire fixation. The lunotriquetral ligament was repaired with a 2.0 mm anchor. Then a volar approach was performed to release the median nerve and to repair the volar capsule tear using Ethibon 3.0. A lateral Kaplan approach to the elbow was performed, the radial head was fixed with 3 screws 3.2 mm and the lateral collateral ligament was repaired with a 5.0 mm suture. Joint stability was confirmed with fluoroscopy. An above the elbow splint was used during the first two weeks and was switched for a below the elbow splint during 4 weeks. No postoperative complications were noted. At the sixth week the K wires and the wrist splint were removed and physiotherapy was started at the wrist (Fig. 4), at 3 months post op he had a 15° limitation in the extension of the elbow and he had no deficits in pronation-supination, after 6 months post op, (Fig. 5) he had a limitation of about 10° of elbow extension and he returned his daily activities with restriction, after 12 months he presented good image consolidation and no pain.



Fig. 4. Hand face radiography in sixth week postoperative.

Discussion

Currently in the literature there are about 13 cases described [1] of floating forearm and only 2 cases with terrible elbow triad injury [2,3]. The typical injury mechanism is a forced wrist hyperextension with cubital deviation [4,5] and on the elbow is the result of a fall under the forearm in extension with transmission of the valgus load [6]. It is similar to what our patient described. Perilunar dislocation represents about 10 % of wrist injuries [5] and is classified according to Mayfield stages. In this case it could be classified in the stage III of Mayfield. The scaphoid is the most common associated fracture, (61 %) of the cases [4,5,7,8], similar to our case.

It is necessary to have a high degree of suspicion because this diagnosis goes unnoticed in about 25% [2,7,9]. It is recognized that early diagnosis and primary surgical treatment offers better outcomes than the conservative treatment, and the goals for surgical treatment are early reduction, ligament repair and fracture fixation [2,4,7,9]. Therefore allowing satisfactory stabilization and better functional outcomes [10]. Literature lacks prospective studies, although the double approach has been commonly used with reports of better outcomes due to the high risk of median neuropathy [7].

There is no algorithm treatment for floating forearm. Rapid reduction is necessary due to the high risk of neuropraxia and compartment syndrome [9]. Our treatment option is in line with others clinical reports, favoring surgical treatment. Conservative treatment of floating forearm is associated with poor results [2]. There is not enough data about the immobilization period and rehabilitation program. It has been described 3 weeks of immobilization with a posterior splint above the elbow exchanging to a below the elbow. After 6 weeks the splint and K wires were removed. The Physiatric training begin at 3 weeks postoperative for the elbow and 6 weeks for the entire upper limb.

This case demonstrates a rare lesion with several adversities and difficult management, from the surgical timing as well as the type of immobilization, always taking into account the surgeon's experience. The wrist dislocation fracture is easily misdiagnosed in the floating forearm, because of the pain and evident deformities of the elbow leading to a bias. Which, it has happened in our case. The floating forearm with a terrible triad is a rare identity and it should be recognized and reduced in an emergent manner as urgent. One must be highly suspicious of the trauma mechanism to obtain an early diagnosis and a more appropriate surgical treatment. Post-operative rehabilitation is also very important.



Fig. 5. Elbow face radiography in sixth months postoperative.

Declaration of competing interest

The authors do not have any potential conflicts of interest with respect to this manuscript.

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