5th Carpo-metacarpal dislocation with metacarpal fractures - a rare clinical couplet.

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Abstract: Hand injuries are one of the commonest injuries seen in the emergency department. Of these, dislocations of the carpo-metacarpal (CMC) joints are very rare. The treating surgeon must do a thorough examination and obtain radiographs in the AP, lateral and the oblique views to make a diagnosis, or else these injuries will be missed. We present a couplet of fifth CMC joint dislocations seen back to back by the two authors. The first case was treated non-operatively and the more unstable volar dislocation underwent surgery. We present these cases for their rarity and present a brief discussion on the management of these rare injuries.

IndexTerms **– carpo-metacarpal dislocation, hand injuries, dislocation, Fifth carpo-metacarpal.**

Abstract:

Introduction:

Hand injuries are one of the most frequent injuries seen in the ER [1]. Dislocations of CMC joints are rare and very few cases are reported. This injury has varied presentation and must not be missed during examination or radiography. We present a couplet of cases of 5th CMC dislocations. The 2 patients presented 1 week apart and it is uncommon to see such rare cases back to back. The patients were treated with non-operative and operative measures, implying that both treatment options are viable and decision is based on the stability after reduction of the dislocation. Examination of these injuries must include a detailed neurological assessment of the ulnar nerve which lies volar to the 5th CMC joint [2].

Case report 1:

A 26 year old right handed male software engineer presented to the ER with history of fall from his motorbike. He complained of pain in his right hand. He had no other injuries. He did not complain of numbness of his fingers. Upon examination, swelling was noted over the dorsum of the right hand. There was tenderness over the 4th and 5th metacarpal bones with decreased range of movements of the ring and little finger. There were no external injuries. The patient did not complain of numbness in the fingers.

The patient underwent standard AP, lateral and oblique radiographs [Figure 1] of his right hand which revealed a dorsal dislocation of the 5th carpo-metacarpal (CMC) joint and a transverse fracture of the 4th metacarpal bone. The 5th CMC joint dislocation was reduced with longitudinal traction, after a hematoma block. A repeat X-ray [Figure 2] showed reduction of the dislocation. The patient was offered surgery for the 4th metacarpal fracture but the patient opted for non-operative treatment. A below elbow POP was applied. The patient was lost in follow up.

Case report 2:

A 72 year old right handed male patient presented with a fall in the park while walking 4 days prior to the presentation to the outpatient department. He complained of pain and swelling in the left hand. He was diabetic and hypertensive on blood thinners (aspirin and clopidogrel). The patient had no other injuries. On examination of the left hand, severe

contusion was noted over the left hand, dorsally and over the palm. The patient had diffuse tenderness over the dorsum of the hand and there was foreshortening of the left little finger. Radiographs of the left hand [Figure 3] showed dorsal 5th CMC dislocation with considerable displacement and fractures of the head of the 3rd and 4th metacarpal bones. Surgery was planned after 3 days awaiting partial resolution of the oedema. Under regional block, the 5th CMC joint dislocation was reduced with traction. The reduction was unstable and was subluxating dorsally. The reduction was stabilized with 2 divergent K-wires. The fractures of the 3rd and 4th metacarpal heads were also stabilised with single K- wires [Figure 4]. A below elbow slab was applied. During follow up the patient developed blood filled blisters in the web spaces which healed well eventually. The K-wire in the 3rd metacarpal was inadvertently pulled out partially during a dressing in the 3rd week, which was left in situ. At 5 weeks a check X-ray [Figure 5] was done and all the K-wires were removed and the hand was mobilised. The patient is presently undergoing physiotherapy for hand and finger movements.

Discussion:

Hand and finger injuries are among the most frequent injuries seen in the emergency room. Isolate dislocations of the CMC joints are rare and constitute less than one percent of all hand injuries [3]. These dislocations may be classified based on direction of displacement, ease of reduction and the stability after reduction. The dislocation may be dorsal, volar or lateral. Dorsal dislocations are the commonest type (>85%) due to the failure of the dorsal ligaments at the insertion before the failure of the volar structures [4]. Subluxations are more common than dislocations and these have better stability after reduction and can be managed non-operatively.

CMC dislocations are classified as simple or complex based on the ease of reduction. Simple dislocations are easy to reduced and more stable upon reduction due to the absence of soft tissue interposition. The dislocation is termed as complex if there is interposition of soft tissue which hinders easy reduction of the dislocation. These injuries may need surgical intervention more often. The tendon of extensor carpi radialis brevis (ECRB) is often interposed in such cases [5].

CMC dislocations are further classified as stable or unstable based on the stability post reduction. Stability of the reduction is assessed with stress radiographs and fluoroscopy. Unstable reductions need to be assessed for soft tissue interposition and may need surgical intervention.

Treatment of simple subluxations and dislocations involve reduction under hematoma block and closed reduction. If the reduction is stable after reduction a simple below elbow plaster for 4 to 6 weeks will suffice. In complex injuries, an open reduction may be required to clear the interposed soft tissue. All unstable injuries will need surgical stabilization. A study conducted to compare results of fixation for fourth and fifth CMC joint dislocations concluded that fixation with Kirschner wires (K-wires) were superior to fixation with plate and screws [6].

The first patient in our report had a simple, dorsal dislocation of the 5th CMC joint which was stable on reduction. A below elbow slab was applied and the patient was advised surgery for the fourth metacarpal fracture. The patient wanted non-surgical treatment and was later lost in follow up. The second patient had a more severe injury with which was a complex dislocation with severe volar and proximal migration of the metacarpal bone which was unstable upon reduction. The patient underwent closed reduction and fixation with K-wires. Associated metacarpal fractures were also reduced and fixed with K-wires. The limb was placed in plaster for 4 weeks. The patient is presently undergoing hand rehabilitation.

Conclusion:

CMC joint injuries are rare and tend to be missed. The treating surgeon must be vigilant and multiple X-rays might be necessary to confirm the diagnosis. Dorsal dislocations are more stable injuries and can be treated non-operatively. Volar dislocations tend to be unstable injuries and complicated with tendon interposition during reduction, which usually requires surgical management.

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Figures- Case 1

Figure 1: Case 1-Pre-reduction X-rays (yellow arrow – CMC joint dislocation, White arrow – Metacarpal fracture)

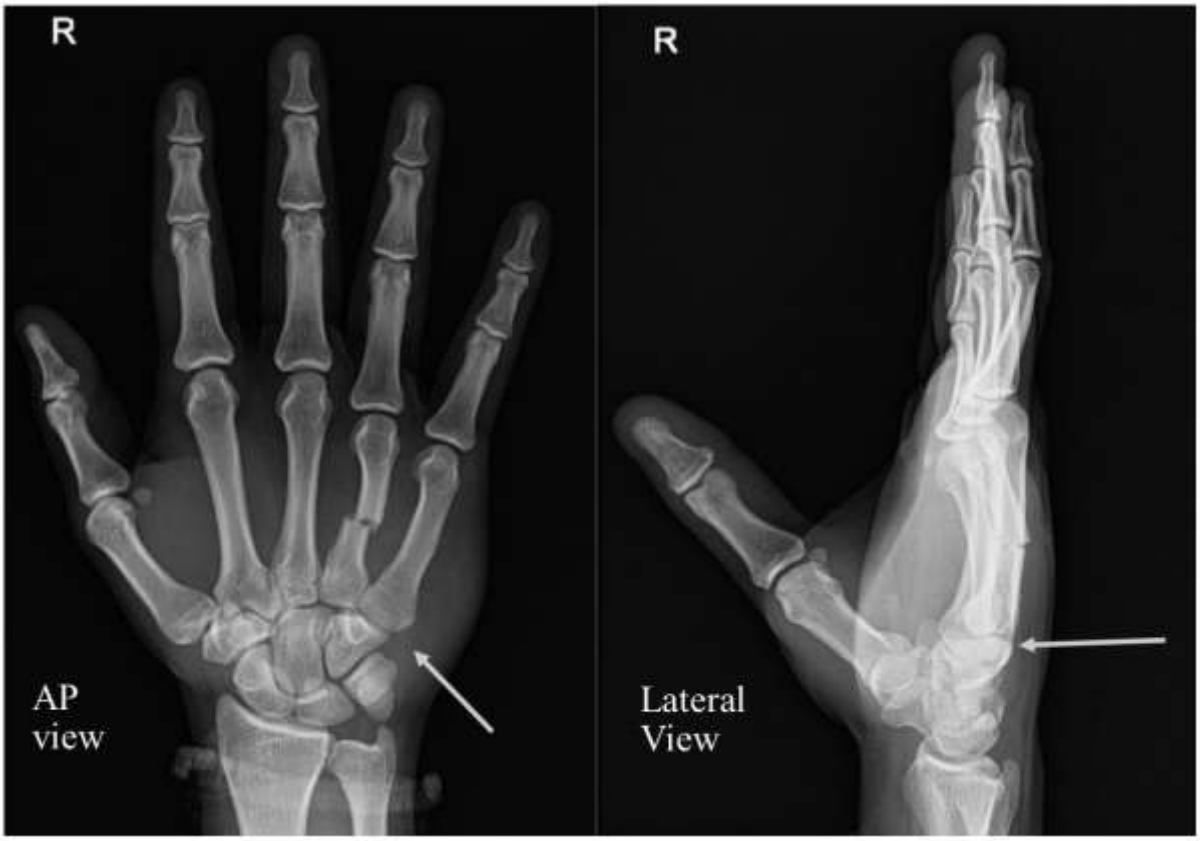

Figure 2: Post reduction X-rays (white arrows pointing to the reduction)

Figures – Case 2

Figure 3: Case 2- Preoperative X-rays of the hand

A- White arrows showing 5th CMC joint dislocation, yellow arrows showing 3rd and 4th metacarpal fractures

B- C-arm images showing volar dislocation of the 5th CMC joint

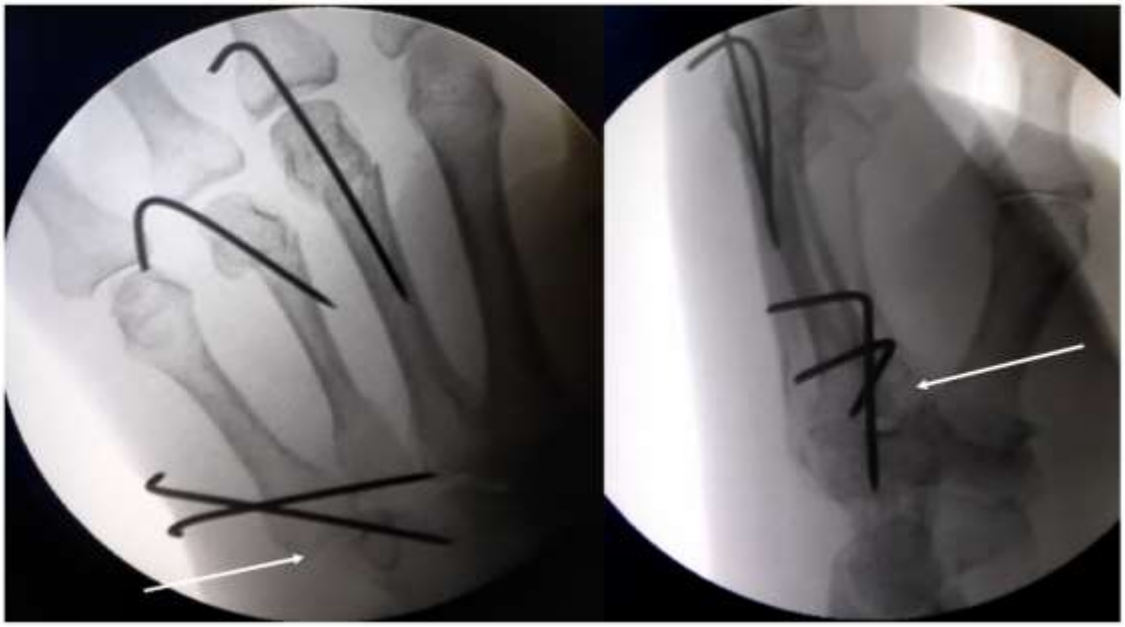

Figure 4: C-arm images showing reduction of the 5th CMC joint held in reduction with 2 K-wires

Figure 5: 6 weeks post-surgery X-rays showing implants in situ