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CARPO METACAPAL DISLOCATION WITHOUT FRACTURE : A CASE REPORT

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ABSTRACT

Traumatic carpo-metacarpal dislocations without associated fractures are rare, and the palmar variant is particularly exceptional. If left untreated, these injuries can lead to instability and premature joint degeneration. We report the case of a palmar carpo-metacarpal dislocation of the fourth metacarpal in a 42-year-old woman. Upon clinical examination, the patient presented with a 10-degree rotational deformity and limited adduction (radial inclination). Imaging revealed a diastasis between the bases of the fourth and fifth metacarpals, along with a palmar dislocation of the base of the fourth metacarpal. Treatment consisted of a closed reduction, stabilized with pinning, followed by joint immobilization for 6 weeks. After a 15 months follow-up, the patient was pain-free and had resumed all activities without any discomfort.

KEYWORDS

Carpo metacarpal dislocation , hand surgery , hand trauma , pure dislocation

MAIN ARTICLE

Introduction :

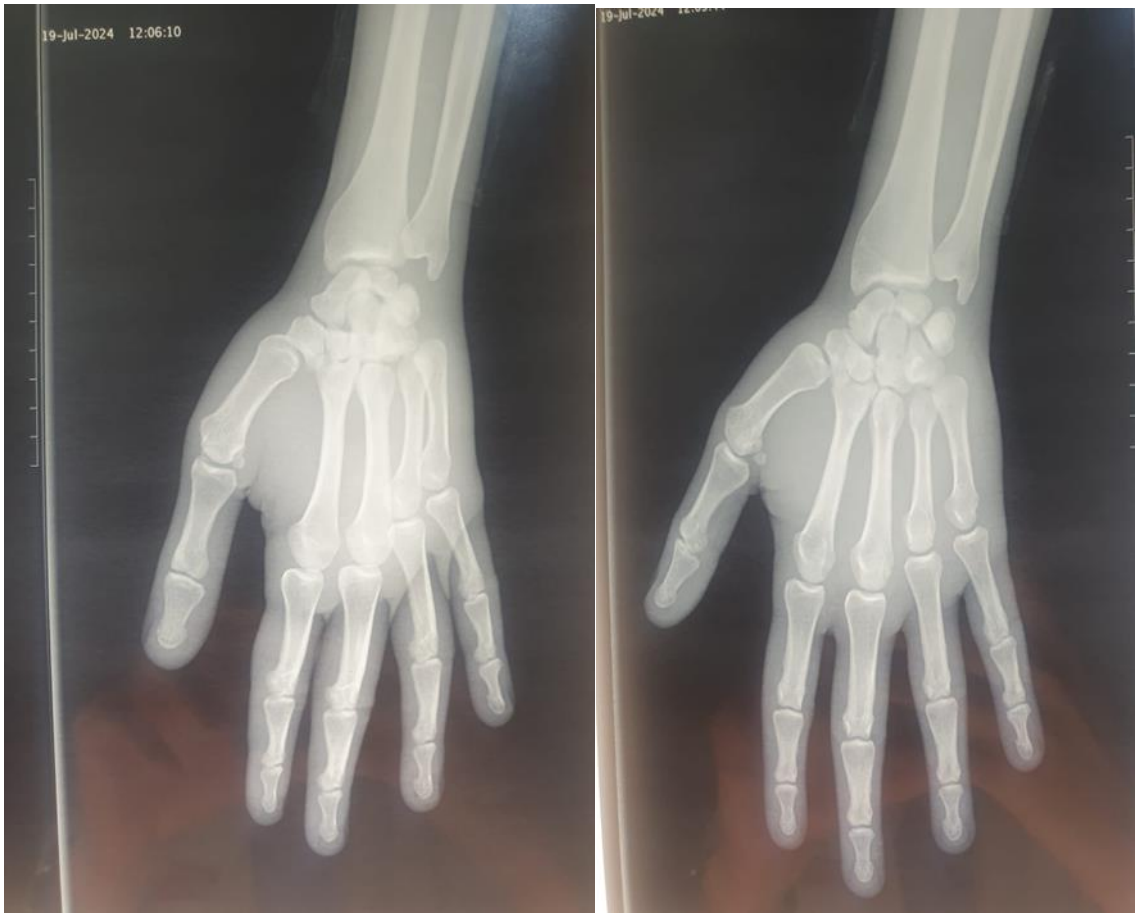
Carpo-metacarpal dislocations are relatively rare injuries, particularly in their palmar form. The first documented case of carpo-metacarpal dislocation was reported by Rivington in 1873 [1], while Nalebuff described the first case of palmar carpo-metacarpal dislocation in 1968 [2]. Since then, sporadic cases of palmar carpo-metacarpal dislocations have been published in the literature [1–24] (see Table 1).

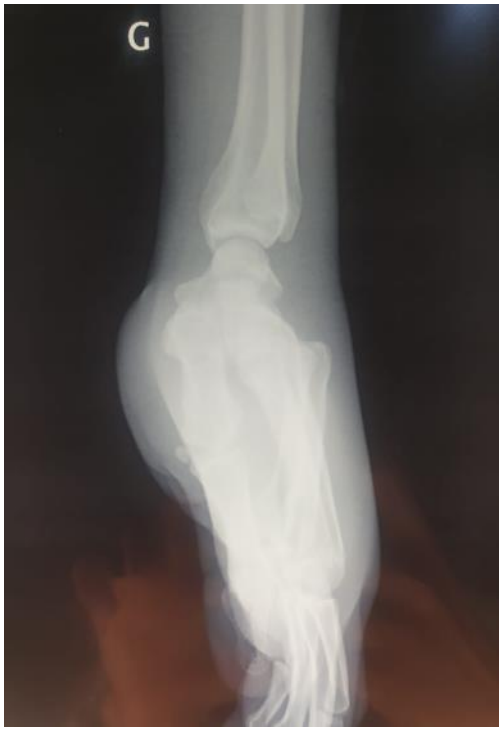
Références	Auteurs	Rayon(s)	Luxation	Fracture(s) associée(s)	Nombre de cas
[1]	Kneife	1–5	Post	0	1
[2]	Nalebuff	5	Ant	0	1
[3]	Bajekal	2–5	Ant	0	1
[4]	Dillon	2	Ant	1	1
[5]	Gore	5	Ant	0	1
[6]	Hazlett	2–5	Post	0	11
[7]	Inui	2–3	Ant	0	1
[8]	Jameel	2–3–4	Ant	0	1
[9]	Kahlon	2–5	Ant	0	1
[10]	Kleinman	2–5	Ant	0	1
[11]	Kumar	2–5	Ant	0	4
[12]	Lintner	5	Ant	0	1
[13]	Nakayama	5	Ant	0	1
[14]	O'Rourke	5	Ant	1	1
[15]	Pack	2	Ant	0	1
[16]	Peterson	5	Ant	1	1
[17]	Prokopis	4–5	Ant	0	1
[18]	Schutt	2	Ant	0	1
[19]	Sreedharan	5	Ant	0	1
[20]	Tomita	2–3–4	Ant	0	2
[21]	Tountas	5	Ant	0	1
[22]	Woo	2–3–4	Ant	0	1
[23]	Yamakado	5	Ant	0	1
[24]	Young	4–5	Post	0	1
[25]	Hsu	4–5	Post	1	2

These dislocations primarily occur as a result of high-energy trauma in young adults. The displacement, whether palmar or dorsal, is caused by a violent force perpendicular to the head of the metacarpal at the moment of impact, acting as a lever on the carpo-metacarpal joint. The initial diagnosis can be difficult due to the seemingly normal appearance on radiographs. The recommended treatment is typically closed reduction followed by immobilization. However, open reduction with internal fixation may be required in cases of late diagnosis. Chronic carpo-metacarpal dislocation can lead to persistent pain and weakened grip strength [6,25], sometimes requiring arthrodesis, which is often poorly tolerated. The aim of this article is to present a case of this rare injury, where the diagnosis requires a thorough clinical examination and careful radiological analysis.

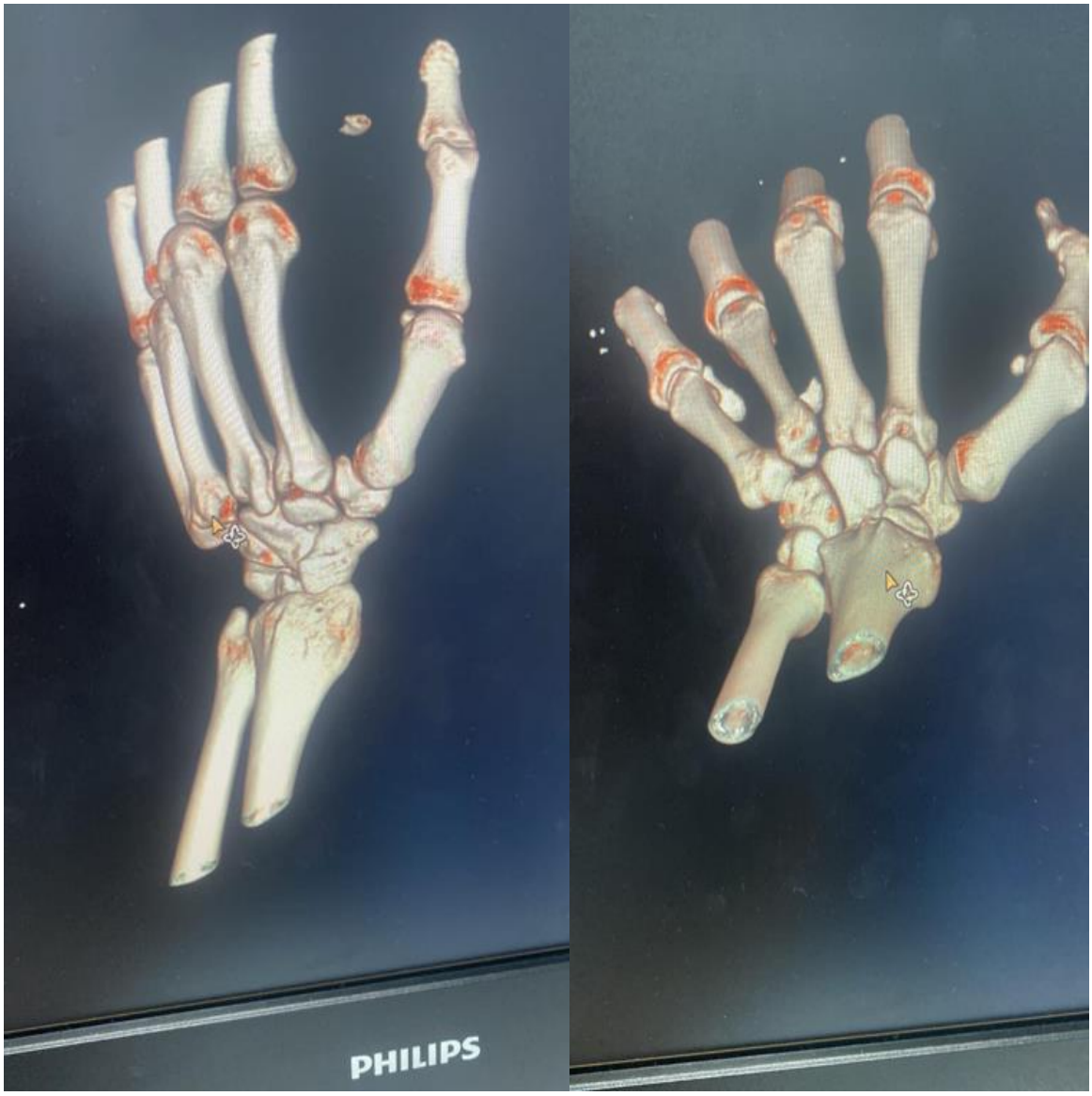
Case presentation :

The patient was a 42-year-old left-handed housewife with no medical history, who suffered a fall onto an obstacle with outstretched hands. She experienced intense pain on the ulnar side of her left hand, along with swelling and deformity, leading to functional impairment, which prompted her to visit the emergency department. Clinical examination revealed a palpable bony prominence over the fourth ray and a 10-degree rotational deformity, with limited passive adduction (radial inclination) and an absence of active adduction. There were no vascular or nerve issues. Standard radiographs showed shortening of the fourth metacarpal with a posterior dislocation, more visible on the lateral view.

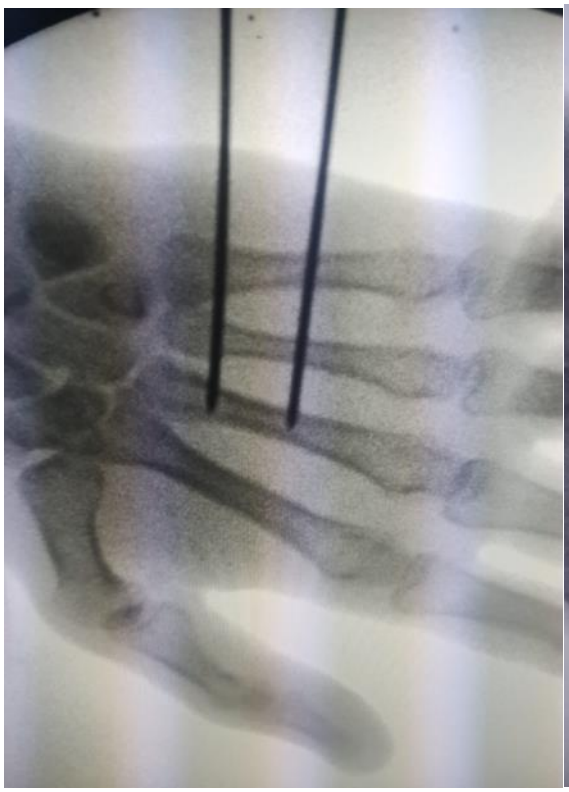


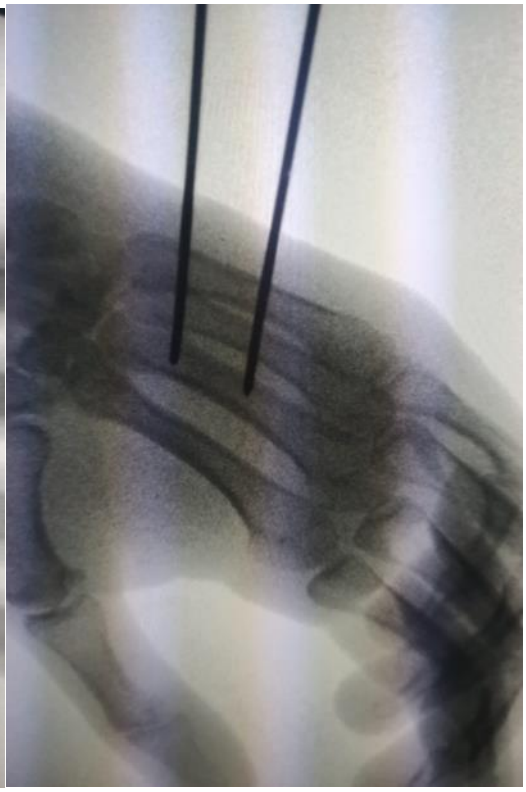


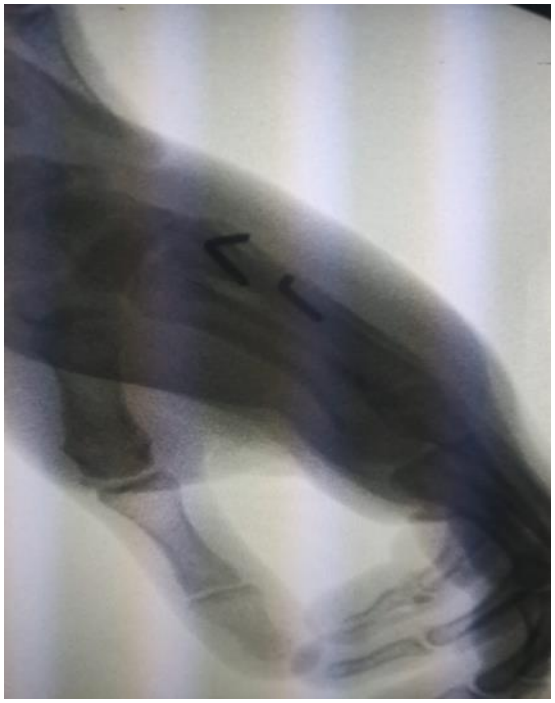
The radiographic assessment was supplemented by a CT scan with 3D reconstruction, which revealed a palmar dislocation of the base of the 4th metacarpal. This dislocation was visible at both the capitometacarpal and hamatometacarpal joints, as well as between the bases of the 4th and 5th metacarpals, without any associated fractures of the carpal bones (see Fig. 3).



Under regional anesthesia and radiological guidance, a closed reduction was performed, accompanied by a noticeable sensation and sound of a click, indicating a reduction , but non stable. The patient received metacarpal fixation of the 3rd and 4th metacarpals using two Kirschner wires (Figs. 4 and 5). No ligament repair was performed. An immobilization with a forearm-to-palm splint was prescribed for six weeks, with hand elevation and active finger mobilization. Postoperative X-rays confirmed a perfect reduction of the dislocation.







At 15 months of follow-up, the patient experienced no pain and had regained full hand function. She had resumed her usual activities, with normal finger flexion, and unrestricted, symmetrical ranges of motion.

1. Discussion:

The carpo-metacarpal joints are particularly stable due to the convergence of several ligaments, including the intermetacarpal, palmar carpo-metacarpal, and dorsal carpo-metacarpal ligaments [2]. Only violent trauma can lead to carpo-metacarpal dislocation [26]. This type of injury is rare, accounting for less than 1% of wrist and carpal injuries [27]. Radiological diagnosis can easily be missed on standard X-rays, especially in the absence of an associated fracture. The use of dynamic radiographs with compression or traction can aid in diagnosis [23]. On standard X-rays, displacement of the 4th metacarpal relative to the hamate or capitate is often observed, with misalignment and overlap. Clinically, signs such as pain, hematoma swelling, hand deformity, and functional impairment are noted. Carpo-metacarpal dislocations are generally dorsal, often associated with fractures, and primarily affect young adults following two-wheeler accidents, where a violent impact causes the metacarpals to hit the handlebars [28]. A direct mechanism involves force applied to the base of the metacarpals, causing dorsal or palmar dislocation depending on the direction of the force, while an indirect mechanism involves force applied to the metacarpal head, resulting in dislocation of its base. The Costagliola classification (1966), based on the location, number, and displacement, is the most widely used, and distinguishes between two axes: the columnar axis for the thumb and the spatulate axis for the long fingers. Palmar dislocations account for 6% of spatulate dislocations [29]. There is no consensus on treatment, but surgery is often necessary, involving closed reduction (or open if the reduction is not anatomical), followed by carpo-metacarpal or metacarpal pinning. Postoperative immobilization for four to six weeks is generally recommended. Inadequate treatment can lead to serious complications, highlighting the importance of early diagnosis. The deep branch of the ulnar nerve, located near the 5th carpo-metacarpal joint, is vulnerable to both dorsal [16,24] and palmar [5,14] dislocations. The prognosis for carpo-metacarpal dislocations is generally favorable, though there is a risk of persistent pain and limited movement.

Conclusions:

Palmar carpo-metacarpal dislocations are rare injuries, often diagnosed late. Their treatment is generally surgical, involving carpo-metacarpal pinning. With appropriate treatment, the prognosis is favorable. Palmar dislocation is characterized by abduction of the little finger (ulnar inclination); in our case, closed reduction was straightforward and appeared stable, but pinning was performed as a precaution.

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