

A Rare Case of Divergent Carpo-Metacarpal Fracture-Dislocation in a Young Athlete

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Received: July 17, 2023; **Published:** July 28, 2023

Abstract

Dorsal carpometacarpal dislocations of the long fingers, particularly divergent dislocations, are extremely rare injuries. We present a case of a 25-year-old athlete who sustained a divergent carpometacarpal fracture-dislocation in the last four fingers during a kick-boxing competition. Diagnosis can be challenging, necessitating thorough radiographic evaluation. Prompt reduction and stabilization using oblique, intramedullary, or cross-pinning techniques are recommended. Complications may include persistent pain, decreased grip strength, and secondary displacements. Early recognition and appropriate management are crucial for optimizing outcomes in these rare injuries.

Keywords: *Carpometacarpal Dislocation; Fracture-Dislocation; Divergent Dislocation; Fracture*

Introduction

Dorsal carpometacarpal dislocations of the long fingers are traditionally considered rare [1-5]. Divergent dislocations are exceptionally uncommon [6-9]. The primary etiology often involves motor vehicle accidents, where fractures of the carpal and metacarpal bones are frequently associated with the dislocation due to the severity of the trauma, thereby compromising functional prognosis. We present the case of a 25-year-old patient who experienced a divergent carpometacarpal fracture-dislocation in the last four fingers following a fall during a national kick-boxing competition.

Observation

The patient is a 25-year-old male athlete who presented to the emergency department at Avicenne University Hospital Center in Rabat.

The patient complained of severe pain and deformity in his dominant hand following a traumatic incident while participating in a kick-boxing competition. He reported a sudden fall on an outstretched hand, resulting in immediate pain, swelling, and an obvious deformity of the hand.

Upon examination, the patient's dominant hand displayed a visible deformity, there was notable swelling, tenderness, and limited range of motion in the affected hand. Sensation and distal pulses were intact, ruling out any associated neurovascular compromise.

X-ray imaging of the hand revealed a divergent carpometacarpal fracture-dislocation of the last four fingers, as well as associated fractures of the fifth and the head of the second metacarpals. The second metacarpal was dislocated posteriorly while the last three metacarpals had palmar dislocation (Figure 1).

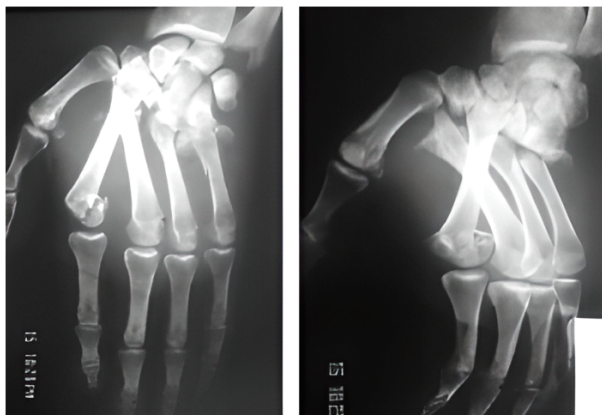


Figure 1: Divergent carpo-metacarpal dislocation of the last four fingers with fractures of the head of the second metacarpal and the base of the fifth metacarpal.

Given the severity of the dislocation and the functional impairment, an emergent surgical intervention was deemed necessary. The patient underwent open reduction and internal fixation of the carpo-metacarpal joint using Kirschner wires. The procedure involved realignment of the dislocated bones followed by an axial pinning of the fifth, third and second carpometacarpal joints and transverse intermetacarpal Kirschner wire under fluoroscopic control (Figure 2).



Figure 2: Postoperative radiograph after open reduction and fixation with axial carpo-metacarpal and transverse intermetacarpal Kirschner wire placement.

Following the surgery, the patient's hand was immobilized with a splint to maintain proper alignment and protect the surgical site for six weeks. He was prescribed pain medication and instructed to elevate the hand to minimize swelling. The patient was advised to follow a rehabilitation program, including hand therapy and range of motion exercises, to promote recovery and regain optimal hand function.

The patient was scheduled for regular follow-up visits to monitor the healing process, assess hand function, and remove the Kirschner wires at the eight weeks. five months later, the patient resumed his professional activity. After two years follow-up no recurrence of the dislocation or arthritic phenomena was identified.

Discussion

Dislocations of the carpometacarpal joint in the long fingers are uncommon injuries [1-5]. However, divergent carpometacarpal dislocation specifically in the long fingers is exceptionally rare [6-9]. These injuries are often related to road traffic accidents and high-energy traumas [2].

Clinical diagnosis is often challenging, particularly in the context of polytrauma, which explains the significant number of overlooked or subsequently treated cases. Anteroposterior and lateral views, clearly demonstrating the direction of displacement, as well as oblique views to assess the individual metacarpals, are essential to confirm the diagnosis [10]. During routine anteroposterior imaging, the assessment of the carpometacarpal joint involves the use of parallel "M lines" as described by Gilula [11]. If there is overlap of joint surfaces, loss of parallelism, or asymmetry at the carpometacarpal joints, it should raise suspicion of a potential subtle carpometacarpal injury. Additional computed tomography (CT) scan may be necessary for a more comprehensive analysis of the injuries and to detect any associated lesions that may have been overlooked during the interpretation of standard radiographs. There are various types of carpometacarpal dislocations, including complete or partial volar dislocations, palmar dislocations, lateral dislocations primarily affecting the fifth ray, or divergent dislocations [2,6-8,11].

Orthopedic reduction is typically feasible when the dislocation is recent and occurred within the past ten days [5], however, there is a higher risk of redislocation of carpometacarpal joint, as compared to open reduction. Open reduction is recommended by many authors especially in fracture dislocations to guarantee anatomical reduction [2,4,8,11]. The stabilization of carpometacarpal joint spaces with oblique, intramedullary, or cross-pinning remains the technique of choice [12]. Due to the intact intermetacarpal ligaments in complete volar dislocations, Hartwing and Louis recommend stabilization of only the second and third metacarpals after reduction [13]. Postoperative immobilization in the intrinsic-plus position for a duration of five to six weeks is recommended, followed by Physiotherapy of hand and wrist joint to avoid postoperative stiffness [14]. Complications such as persistent hand pain, decreased grip strength, subluxations, and secondary displacements have been reported in the literature [15]. The presence of associated injuries, persistent subluxations, and soft tissue damage are factors associated with a poor prognosis.

Conclusion

Dorsal carpometacarpal dislocations of the long fingers are extremely rare injuries with a purely radiological diagnosis. Proper management involves urgent reduction and stabilization with pins. Postoperative immobilization should be followed by well-conducted rehabilitation to achieve a favorable outcome.

Conflict of Interest

Nothing to report.

Acknowledgments and Funding Sources

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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Volume 14 Issue 8 August 2023

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