

Isolated hamate dislocation with simultaneous carpometacarpal subluxation. A case report

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ABSTRACT

Background: Hamate dislocation is a rare injury resulting from high energy trauma of the hand. Isolated or combined with other injuries, volar or dorsally dislocated should be recognized and treated so as to restore anatomically adjacent carpal bony structures. Treatment can be closed or open with internal stabilization. Physiotherapy should follow until satisfactory joint motion and hand grip strength is achieved.

Case Report: We present an isolated volar hamate dislocation, with simultaneous ulnar translation of the fourth and fifth metacarpal bones, following a crush injury due to high pressure hydraulic machine. To the best of our knowledge, no such a case has been described. During open surgical exploration hamate was identified intact and was pinned to adjacent bones with Kirschner wires. Following intense physiotherapy the patient returned to previous level of working activity.

Conclusion: Open reduction and stabilization with K-wires can be an effective and definite surgical treatment in complex dislocations of the hamate.

KEY WORDS: hamate; dislocation; crush injury; carpometacarpal dislocation

Introduction

Isolated hamate dislocation was first described by Buchanan in 1882 [1]. As considered a rare medical case, combination with associated carpal or metacarpal traumatic injuries makes it even rarer. Usually it results from a high energy injury. We currently present a volar dislocation of the hamate, associated with carpometacarpal subluxation of the 4th and 5th metacarpal.

Case presentation

A 50 years old carpenter presented to the emergency department, following an open crush injury of his left hand and carpus that he sustained four hours prior to his arrival, caused by high pressure hydraulic machine similar to a punch press. He did not report any other injuries and was otherwise healthy. Full thickness, open lacerations were noticed at the thenar and hypothenar regions, as well

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Fig. 1 Anteroposterior X ray of the left hand. Diastasis at the base of the 3rd and 4th metacarpal and absence of the hamate is noticed

as at the dorsal side of his thumb and wrist. Edema and numbness were detected on clinical examination. The patient was not able to move his joints peripheral to the carpal joint, due to imperative pain, while there was slow-running blood flow in all digital vessels as confirmed by Doppler examination performed. Plain anteroposterior and lateral x rays revealed a complete volar dislocation of the hamate and ulnar dislocation of the ring and small finger (**Fig.1**). Computed tomography (CT) scan was unavailable at that time due to technical issues, so the patient was directly transferred to the operating room for surgical management.

Under general anesthesia a dorsal approach through the 3rd and 4th extensor compartment was performed, the retinaculum was dissected in a rectangular shape, with its base on the radial side, and extended the open wounds regions. The hamate was identified. No fracture of the hook was noticed. After the anatomical reduction of the hamate, carpal

instability was detected, due to the subluxation of the 1st, 3rd, 4th, and 5th carpometacarpal joints. Reduction and stabilization was achieved through k-wires fixation. The hamate was pinned directly to the capitate, the capitate to the scaphoid and the 1st row (**Fig. 2 a,b**). Gilula's arc was restored anatomically. No neurovascular injury was detected. Complete rupture of the extensor indicis and the extensor digitorum communis was restored anatomically. Wounds were closed as per standard approach and a palmar plaster cast was applied in neutral position for maintaining the restoration and for soft tissue healing.

The patient received intravenously dispersed antibiotics for 4 days switched to oral delivery, for 10 more days right after his discharge from the hospital as per standard protocol. No complications were documented postoperatively. K-wires were retracted 6 weeks postoperatively and a night splint was utilized for additional 6 weeks (**Fig. 3**) following intense physiotherapy. At the 1 year follow up, range of motion in all joints was almost painless and satisfactory as well as the grip strength. At that time, minimal radiographic changes of arthritis affecting the 4th and 5th carpometacarpal joint were noticed. The patient did not return for further follow up.

Discussion

Dislocation of the hamate was first described from Buchanan in 1882. [1] It is a rare injury and is usually associated with severe trauma, predominantly among manual workers. [2, 3] Volar dislocation is slightly more often than dorsal. It can be an open or closed injury [4], isolated [5] or combined with metacarpal or other carpal bone dislocation ⁶⁾ or even fracture. Our patient sustained a crush injury, followed by an isolated dislocation of an intact hamate bone. Simultaneous fracture of the hook of the hamate is unusual. Garcia-Elias described a classification for carpus dislocations, according to which the hand was divided in two columns, the radial and the ulnar one.⁷⁾ Injuries were classified as axial-radial, axial ulnar and axial-radial ulnar.

Possible mechanism of injury is still controversial. Pisohamate, capitohamate and intracarpal lig-

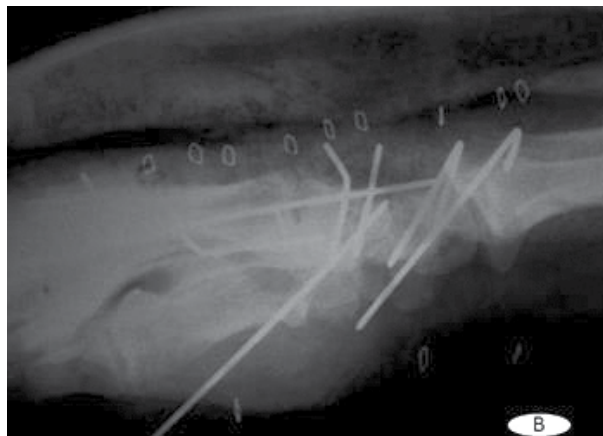


Fig. 2a,b Anteroposterior and lateral view immediately postoperatively

aments provide rigid stability. Forces can be transmitted directly or indirectly. Volar dislocation with ulnar translation of the metacarpals probably occurs when the hand while being in flexion with ulnar deviation, the force is transmitted axially.⁵⁾ On the other hand fracture of the hook of the hamate occurs in plantar fascia's injury, though in our case not presented as expected.

A gap between the capitate and the pisiform is diagnostic in the hamate dislocation in the anteroposterior radiograph of the hand, while on the lateral film volar or dorsal translation can be easily noted. When fracture of the hamate is suspected, oblique and carpal tunnel views are diagnostic.⁸⁾ Albeit CT is more accurate, it should be performed only if the condition of the patient permits to do so. Additionally, it is rather helpful in revealing stress fractures, fractures of the hamate hook or small osteochondral lesions.

Reduction might be closed or open.⁹⁾ Closed manip-




Fig. 3 Anteroposterior radiograph at 3 months follow up visit

ulation under general or local anesthesia, followed by casting for 6 weeks, is a successful choice in some cases.^{5,10)} In our case surgical management was indicated, due to the extensive laceration of the palmar hand. When closed reduction fails, or in cases of open frac-

ture-dislocations, open reduction and internal fixation is the treatment of choice. The use of K-wires in stabilization, for a period of 6 weeks, is simple and accurate. Our patient is one of the few ever managed with open reduction and K-wires fixation. Excision of the hamate has been also reported, especially when the ulnar nerve is under intense pressure by the dislocated carpal bones, with good clinical results.⁹⁾ Intense physiotherapy should always follow until range of motion and grip strength get restored.⁹⁾

Conclusion

Isolated complete dislocation of the hamate is a rare injury, while its simultaneous occurrence with subluxation of the carpometacarpal joints, is even less common. Open reduction through a dorsal approach and stabilization with K-wires is an effective surgical treatment method, with good postoperative results. 

Conflict of interest:

The authors declared no conflicts of interest.

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READY - MADE
CITATION

Tolis K E, Spyridonos S G, Fandridis E H. Isolated hamate dislocation with simultaneous carpometacarpal subluxation. A case report. *Acta Orthop Trauma Hell* 2018; 69(1): 52-55.

ΠΕΡΙΛΗΨΗ

Το τραυματικό εξάρθρωμα του αγκιστρωτού οστού του καρπού αποτελεί σπάνιο τραυματισμό. Πρέπει να αναγνωρίζεται άμεσα για την έγκαιρη χειρουργική αποκατάσταση είτε ως μεμονωμένη βλάβη είτε σε συνδυασμό με άλλες συνδεσμικές βλάβες του καρπού. Η αντιμετώπιση του τραυματικού εξάρθρωματος του αγκιστρωτού πραγματοποιείται με ανοικτή ή κλειστή διαδερμική οστεοσύνθεση. Παρουσιάζεται περίπτωση τραυματικού παλαμιαίου εξάρθρωματος του αγκιστρωτού οστού του καρπού με συνοδό ωλένια μετατόπιση του τέταρτου και πέμπτου μετακαρπίου ως αποτέλεσμα καρπο-μετακάρπιου εξάρθρωματος.

ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ: αγκιστρωτό οστό, εξάρθρωμα, καρπομετακάρπιο εξάρθρωμα