

Perilunate Dislocation about Two Cases of an Often Missed Injury



Yassine Ben Bouzid*, Rida-Allah Bassir, Monsef Boufettal, Jalal Mekkaoui, Mohamed Kharmaz, Moulay Omar Lamrani and Mohamed Saleh Berrada

Department of Orthopaedic and Trauma Surgery, Ibn Sina University Hospital, Rabat, Morocco

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*Corresponding author: Yassine Ben Bouzid, Department of Orthopaedic and Trauma Surgery, Ibn Sina University Hospital, Rabat, Morocco, Email: yassine.benbouzid2@gmail.com

Abstract

Perilunate dislocations are rare and constitute 5% to 10% of all wrist injuries. They are related to ligament injuries. The lunate bone has a precarious vascularization, and any neglect of this pathology could damage the bone and compromise the functional prognosis of the wrist. The patient interview will allow to determine the exact mechanism of the injury as well as the dominant limb. Clinical examination may lead to the identification of probable lesions. Conventional radiography is systematic. It allows to establish the diagnosis, look for associated lesions, and to grade the lesion according to Mayfield's classification. The aim of the treatment is to obtain a better functional result. The choice of approach is guided by the associated lesions, in particular a scaphoid fracture or median nerve compression. Reduction must be done as soon as possible with stabilization using pins. Rehabilitation after a wrist dislocation should be systematic. We report two cases of perilunate dislocation that were diagnosed on the day of the trauma using imagery. Open reduction and fixation of the dislocation with Kirschner wires was performed in both patients. After 9 months in the first case and 12 months in the second one, results were satisfying with resumption of normal activity in both cases.

Keywords: Wrist; Lunatum; Dislocation; Rare

Introduction

Following dislocation is a severe wrist injury resulting from disruption of the soft tissue around the semilunar bone following high energy trauma [1,2]. It is a rare entity that accounts for less than 10% of all wrist injuries [3] with a significant number going undiagnosed at the initial consultation [4,5]. Since perilunate dislocation can lead to median nerve injury, avascular necrosis of the lunate bone and engage the functional prognosis of the wrist by the occurrence of chronic carpal instability and post-traumatic osteoarthritis [5,6], early diagnosis can prevent morbidity and improve prognosis. In addition, the management of a neglected lunate dislocation is more complicated due to fibrosis and the impossibility of obtaining an anatomical reduction of the carpus [6]. Non-surgical treatment is currently abandoned due to poor functional results and recurrence of dislocation.

Case Series

Patient 1

A 28-year-old right-handed manual worker patient was admitted to the emergency room with a closed right wrist injury

following a road traffic accident. The patient reports falling from a motorcycle with landing on the wrist in dorsiflexion. Physical examination has shown edema of the right wrist with limited and painful mobility. There was no sensory-motor deficit, notably in the median nerve territory. The radial and ulnar pulses were well perceived and symmetrical. Two orthogonal radiographic views were performed showing disorganised Gilula's lines with a palmar displacement of the lunate bone (spilled teacup sign) (Figure 1). The distal radial and ulnar extremities were intact. A CT scan was performed showing loss of congruence with palmar dislocation of the lunate bone (Figure 2). The dislocation was classified as stage IV according to the Mayfield classification. The patient underwent an open reduction using a dorsal approach (Figure 3) and fixation with two Kirschner wires (Figure 4). The wrist was secured with a cast that was maintained for 6 weeks. At the 6th week check-up, we removed the pins then a wrist rehabilitation program was established. After 9 months, the patient had regained normal wrist mobility and good carpal alignment with no pain nor recurrence of dislocation.

Patient 2

A 34-year-old patient with no previous medical history, carpenter by profession and right handed, was admitted for a trauma of the left wrist following a fall from a ladder from a height of about 3 meters with landing on the wrist in dorsiflexion. Clinical examination found a swollen and deformed wrist with total functional impairment. There was no sensory-motor deficit nor pulse suppression. Two radiographic views (antero-posterior and lateral) were performed, and showed an enlargement of the scapholunate space (Terry Thomas sign) with a piece-of-pie sign. On the lateral view, there was a palmar displacement of the lunate bone (Figure 5). The perilunate dislocation was stage IV of the Mayfield classification. The patient underwent surgical treatment with open reduction and stabilization with three Kirschner wires (Figure 6). Plaster cast immobilization was performed for 6 weeks. The pins were removed after 8 weeks and rehabilitation was started. After 12 months, the patient regained normal wrist function with no pain nor a decreased grip strength. No recurrence of dislocation was observed.

Discussion

Perilunate dislocation is a rare injury representing less than 10% of all wrist injuries [3]. This injury is the result of a high-energy trauma [7] whose mechanism is hyperextension of the wrist in ulnar deviation and supination [8,9]. Mayfield et al [10] analyzed the degree of carpal instability, ligament damage, and biomechanics of these injuries, which progress in 4 stages from scapholunate diastasis (stage I) to complete lunate dislocation (stage IV). Perilunate instability increases with the progression of the stages described by Mayfield [11].

These injuries are often missed with approximately 25% of cases not diagnosed [2,4,5]. Indeed, physical examination finds nonspecific signs represented by pain, swelling, decreased range of motion and wrist deformity [11]. However, a neuro-vascular examination is necessary because of the frequent association with carpal tunnel syndrome in 29 to 45% of cases [11,13,14]. Radiographic imagery is of great importance for the diagnosis and involves anteroposterior, lateral, and possibly oblique and scaphoid views [15]. Several radiographic abnormalities can be demonstrated. On the anteroposterior view, a scapholunate diastasis >3mm (Terry Thomas sign) may reflect a scapholunate ligament injury. Also, disruption of Gilula's lines raises suspicion of carpal lesions [16]. Finally, the lunate bone may take on a triangular shape due to its rotation known by piece-of-pie sign. On the lateral view, the spilled teacup sign indicates a palmar dislocation of the lunate bone [15]. CT scan can show the extent of the lesion and help in therapeutic planning [11].

Non surgical treatment is rarely indicated for perilunate dislocations. Currently, the management of these injuries refers to surgical treatment. A dorsal approach allows adequate exposure

while preserving a maximum of palmar ligaments [17]. The palmar approach can also be used especially if the carpal tunnel needs to be released [2,7]. The combined approach can also be performed in certain situations [13,17]. Various implants are used to stabilize the dislocation, including pinning for scapholunate and lunotriquetral fixation [18]. Aspergis et al. [19] confirmed the superiority of surgical treatment over closed reduction with cast immobilization in their comparative study. Furthermore, Hezberg et al. [11] had identified factors influencing the therapeutic prognosis, including open injuries which were associated with poorer results compared to closed injuries. In addition, the results obtained after a therapeutic delay were inferior to those obtained in patients operated on early.

Conclusion

Retrolunate dislocations are high-energy traumas responsible for osteocartilaginous and ligamentous lesions, which are a source of significant functional consequences. They are rare and represent about 5% of carpal trauma. These dislocations often go unnoticed. The diagnosis is based on a careful clinical examination and a simple radiological assessment. The treatment is surgical, seeking thereby to avoid complications and improve the functional outcome.

Approval

The study is exempt from ethical approval in our institution.

Patient consent

Written informed consent was obtained from the patients for publication of these two case reports and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Availability of data and materials

The datasets used and analysed during the study are available from the corresponding author.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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Authors contributions

All authors Have read and approved the final manuscript.

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