

Perilunate Carpal Dislocation: A Case Report

Carlos Eduardo Seganfredo Camargo ¹, Luigi Dal Pizzol Coberllini ¹, Matheus Guanabara Fernandes ¹, Rafael Oselame Guanabara ^{1,*}

¹ University of Planalto Catarinense – UNIPLAC, Lages, Santa Catarina, Brazil.

* Correspondence: rafaelguanabara@hotmail.com.

Abstract: Perilunate dislocations of the wrist occur due to instability in the ligaments that stabilize the carpal bones relative to each other. Despite their low incidence, these injuries are highly severe. The aim of this study is to report a case in which it is possible to demonstrate the trauma mechanism, clinical presentation, diagnosis, treatment, and follow-up. The patient is a male with a history of trauma from a fall, diagnosed with perilunate dislocation of the wrist through physical examination and imaging, requiring surgical treatment to restore carpal anatomy. It is concluded that accurate identification and diagnosis of the injury, as well as selection of the appropriate treatment, are essential for preserving limb function and preventing future complications, such as carpal instability, local fibrosis, carpal osteoarthritis, and avascular necrosis.

Keywords: Wrist injuries; Scapholunate ligament; Perilunate dislocation; Carpal bones.

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1. Introduction

The wrist is composed of eight carpal bones, arranged in a proximal row (scaphoid, lunate, triquetrum, and pisiform) and a distal row (trapezium, trapezoid, capitate, and hamate), stabilized by intrinsic and extrinsic ligaments that maintain its anatomy and ensure proper biomechanics. The scapholunate (SL) and lunotriquetral (LT) ligaments are particularly important, as they confer stability to the proximal row [1]. Injury to these ligaments causes instability of the carpal anatomy, leading to perilunate dislocation of the wrist.

This injury is considered rare and highly severe, generally resulting from high-energy trauma [2]. It can be classified based on duration: acute (up to one week), subacute (one to six weeks), and chronic (over six weeks). However, the main classification used for this injury is that of Mayfield et al., which subdivides perilunate injuries into four progressive stages: Type I: scapholunate ligament injury, with or without associated scaphoid fracture; Type II: radioscaphocapitate ligament injury, with capitate dislocation over the lunate; Type III: lunotriquetral ligament injury; Type IV: rupture of all perilunate ligaments with proximal migration of the capitate, dislocating the lunate volarly or dorsally [3]. Additionally, Severo et al. proposed a modification of the Mayfield classification by adding a fifth type, occurring when, in addition to ligament injuries between the lunate and other carpal bones, there is injury to the radiolunate ligament, resulting in complete lunate enucleation and interruption of radiolunate ligament circulation, thereby complicating surgical reconstruction [4].

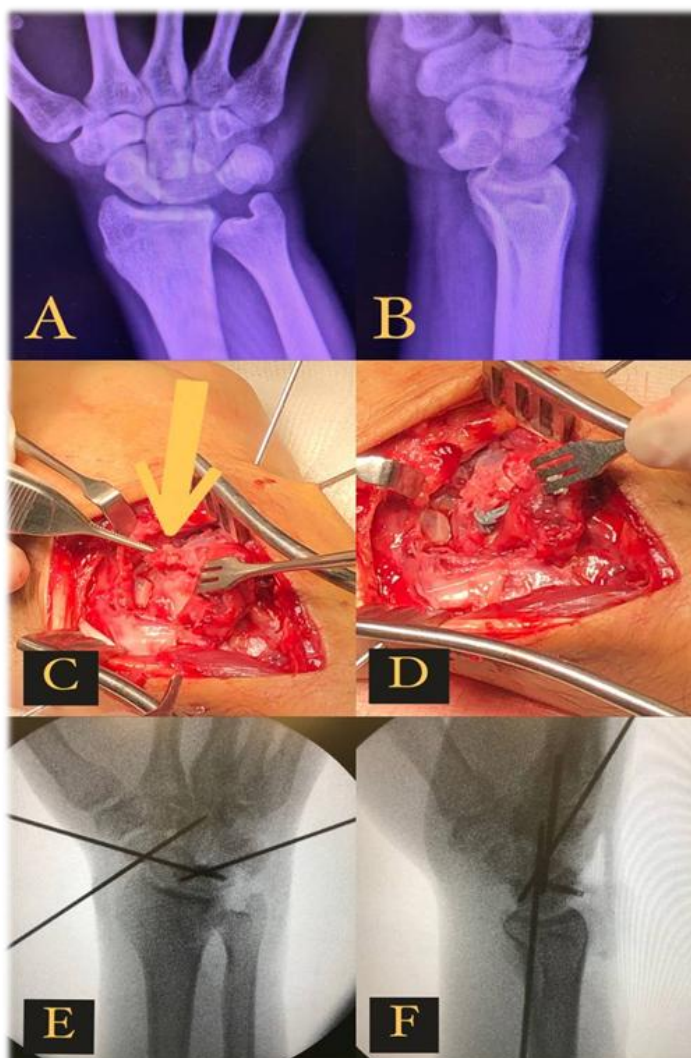
The clinical presentation of this injury includes wrist edema, pain, limited range of motion, and paresthesia. Early clinical and radiological diagnosis is crucial, allowing classification according to Mayfield's stages and enabling appropriate treatment, as the time between injury and intervention is directly related to prognosis [5]. Given this context, the

aim of this study is to present a case report highlighting the clinical presentation and diagnostic methods, as well as describing the treatment, surgical technique performed, and prognosis.

2. Case Report

A 35-year-old male patient presented to the emergency department following a fall from height, reporting severe pain in the left wrist. On physical examination, there was limited wrist movement and paresthesia in the median nerve distribution, with no other signs suggestive of neurovascular compromise. Radiographs of the left wrist revealed a perilunate dislocation without associated fracture (Figures 1A and 1B), classified as Mayfield type IV, indicating the need for surgical repair of the injury.

Figure 1. A. Preoperative anteroposterior (AP) radiograph. B. Preoperative lateral (L) radiograph. C. Identified scapholunate (SL) ligament injury. D. SL ligament repaired with suture anchor. E-F. Postoperative AP and lateral radiographs (fluoroscopy).

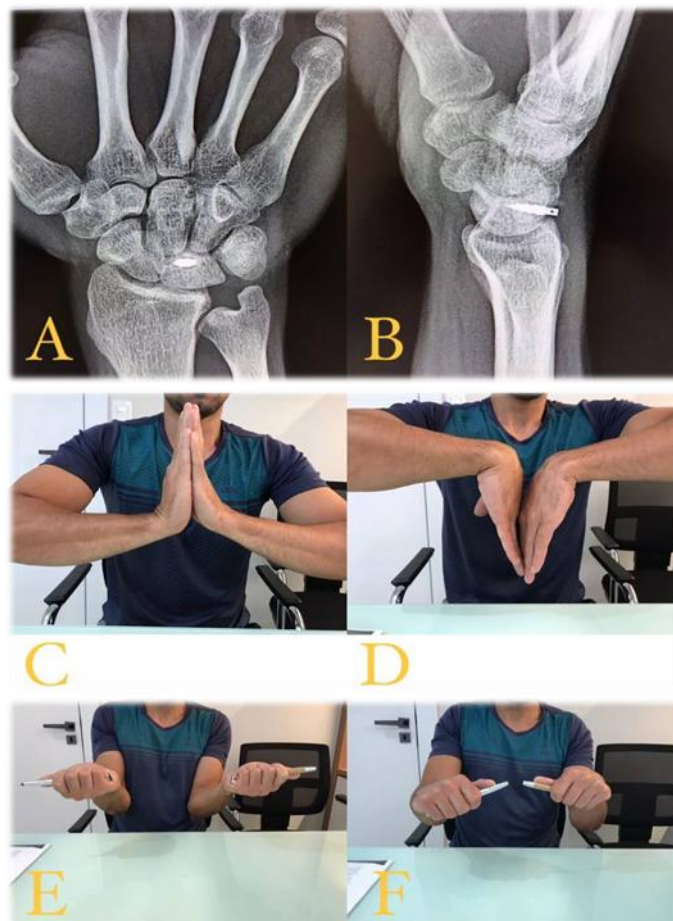


The Tavernier maneuver was then performed to reduce the wrist. This involves one hand of the orthopedic surgeon applying longitudinal traction to the wrist while the thumb of the other hand stabilizes the lunate on the palmar aspect of the wrist. Gradual wrist flexion in this position allows the capitate to return to its anatomical alignment with the lunate, with reduction always performed under anesthesia.

Surgical intervention was carried out via the classic dorsal approach, between the third and fourth extensor compartments. The dorsal scapholunate ligament injury with avulsion from its lunate insertion was identified (Figure 1C). Percutaneous fixation was performed using three Kirschner wires across the scapholunate, lunotriquetral, and scaphocapitate joints. Ligamentoplasty of the scapholunate ligament was performed using a 2.5 titanium anchor, chosen according to the patient's anatomy (Figure 1D), followed by continuous dorsal capsular repair to ensure stabilization. Regarding materials, the anchor is selected individually for each case and may be made of titanium or tissue, with sizes commonly ranging from 1.7, 2.0, 2.3, to 2.5 for this surgery. Dorsal capsule repair can be performed using various suture types; continuous suturing was chosen for optimal fixation and support. Intraoperative radiographs confirmed restoration of carpal anatomy (Figures 1E and 1F).

The limb was immobilized with a plaster splint for eight weeks. After this period, the Kirschner wires were removed, and active and passive wrist movements were initiated, along with motor physiotherapy. At eight months post-surgery (Figure 2), the patient achieved complete functional recovery of the limb, with no limitations in daily activities.

Figure 2. A. AP radiograph. B. Lateral radiograph. C. Extension. D. Flexion. E. Supination. F. Pronation.



3. Discussion

Perilunate dislocation is a severe injury, accounting for less than 10% of wrist injuries [6]. It predominantly affects individuals around 30 years of age and usually involves the dominant wrist. The injury mechanism is associated with high-energy trauma, such as motor vehicle accidents—particularly involving motorcycles—and contact sports; however, the most common cause is a fall from height with wrist hyperextension, ulnar deviation, and carpal supination [2, 7].

Diagnosis is based on physical examination and imaging of the affected limb. Physical assessment evaluates local condition, mobility, strength, and neurological and vascular status. The most frequent findings include edema, pain, decreased mobility and strength, and paresthesia in the median nerve distribution due to compression [5]. Radiographs in anteroposterior, lateral, and oblique views are essential for confirming the diagnosis. On the AP view, Gilula's arcs—imaginary lines drawn along the proximal and distal aspects of the proximal row and the proximal aspect of the distal row—should form smooth, parallel arcs; disruptions suggest carpal incongruence. The lateral view assesses alignment of the capitate, lunate, and radius; perilunate dislocation is suggested by misalignment, with the capitate migrating proximally and the lunate dislocating volarly (more commonly) or dorsally [7, 8].

Computed tomography and magnetic resonance imaging may be used to better visualize complex carpal fractures or involvement of the articular surface [5, 9]. Arthroscopy is another diagnostic tool, using the Geissler classification to assess scapholunate ligament injury severity. Type 1: ligament hemorrhage without structural compromise or widening between scaphoid and lunate. Type 2: partial ligament injury, with a 1 mm probe unable to pass between the bones. Type 3: ligament rupture with attenuation, allowing a 1 mm probe to pass. Type 4: complete interosseous scapholunate ligament rupture, permitting passage of a 2.7 mm arthroscope between the bones, also known as the “drive-through” sign [1].

Three treatment methods are described: 1) closed reduction with cast immobilization; 2) closed reduction with percutaneous fixation and immobilization; and 3) open or arthroscopic ligament repair with fixation and immobilization. Treatment choice depends on available resources and surgical expertise. As a surgical emergency, early intervention is crucial to decompress the median nerve in the carpal tunnel and restore vascular supply to the carpal bones, preventing further injury. Literature shows that patients treated within the first week after injury, regardless of method, have better functional and radiological outcomes compared to those treated later. Moreover, the third treatment method provides the best prognosis, with effective functional recovery and lower risk of future complications [10, 11].

Improperly managed cases may lead to carpal instability, subsequent local fibrosis, radiocarpal and intercarpal osteoarthritis, and avascular necrosis of the carpal bones, resulting in reduced function and mobility [2, 11]. However, further studies with long-term follow-up are needed to better characterize these complications.

4. Conclusion

In conclusion, despite its low incidence, perilunate dislocation of the wrist is clinically significant due to its severity. Early diagnosis and identification of the most appropriate treatment strategy are essential to optimize prognosis and minimize the risk of future complications.

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References

1. Walsh JJ, Berger RA, Cooney WP. Current status of scapholunate interosseous ligament injuries. *J Am Acad Orthop Surg.* 2002;10(1):32–42.
2. Subramanian K. Perilunate dislocation – case report and review of literature. *J Clin Diagn Res.* 2017;11(8):06–08.
3. Tanure AA, et al. Índice de falha diagnóstica na detecção de fraturas e luxações perilunares do carpo utilizando radiografias simples de punho. *Rev Bras Ortop.* 2020;56(3):340–345.

4. Severo AL, Lemos MB, Pereira AP, et al. Trans-scaphoid perilunate fracture dislocation beyond Mayfield stage IV: a case report on a new classification proposal. *Rev Bras Ortop (Engl Ed)*. 2018;53(5):643–646.
5. Ribak S, De Rezende MR, et al. *Atualização em cirurgia da mão traumatologia*. 1st ed. Di Livros; 2021.
6. Rhind JH, Gulihar A, Smith A. Trans-triquetral perilunate fracture dislocation. *Trauma Case Rep*. 2018;14:27–30.
7. Obert L, Loisel F, Jardin E, et al. High-energy injuries of the wrist. *Orthop Traumatol Surg Res*. 2016;102(1):81–93.
8. Pardini A, Freitas A. *Traumatismos da mão*. 4th ed. Medbook; 2008.
9. Etli I, Kozaci N, Avci M, et al. Comparison of the diagnostic accuracy of X-ray and computed tomography in patients with wrist injury. *Injury*. 2020;51(3):651–655.
10. Kara A, Celik H, Seker A, et al. Surgical treatment of dorsal perilunate fracture-dislocations and prognostic factors. *Int J Surg*. 2015;24:57–63.
11. Pinho AB, Sobania RL. Perilunate carpal dislocation. Clinical evaluation of patients operated with reduction and percutaneous fixation without capsular-ligament repair. *Rev Bras Ortop (Engl Ed)*. 2017;52(4):402–409.