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Isolated Dislocation of the Carpal Scaphoid: A Case Report

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Abstract **Case Report**

Isolated scaphoid dislocation is an exceedingly rare event with only a few cases described. It's a rare and uncommon occurrence among carpal dislocations. In this case report, we present the case of a 50-year-old male diagnosed with an isolated radio-palmar dislocation of scaphoid in the emergency department based on clinical and radiological findings. Treatment involved posterior open reduction and fixation using two Kirschner wires under Fluoroscopy the one-year follow-up, the patient showed a favorable outcome, with complete restoration of wrist functioncopic guidance, followed by immobilization in a cast for 45 days.

Keywords: Carpus; Dislocation; Scaphoid.

1. INTRODUCTION

An isolated dislocation of the carpal scaphoid is a rare occurrence among carpal dislocations. To date, only 13 cases have been documented in the current literature, with the first report dating back to 1903 [1-13]. The precise mechanism of the injury remains unknown. Nonetheless, previous reports have suggested that high-energy motor vehicle accidents, characterized by forced wrist dorsiflexion and ulnar deviation of the hand, may lead to the displacement of the scaphoid from its fossa. Prompt diagnosis and treatment are imperative. Treatment strategies may vary between orthopedic and surgical interventions, depending on various criteria. Prognosis largely depends on the timeliness of treatment but generally remains favorable. In this report, we present a case of simple isolated carpal scaphoid dislocation without associated carpal lesions.

2. CASE REPORT

A 50-year-old right-handed tradesman, with no significant medical history, arrived at the emergency department after being involved in a motor vehicle accident: a collision between two motorcyclists causing closed trauma to his left wrist. Clinical examination revealed a painful and swollen wrist, showing a malaligned, locked ulnar tilt. The patient experienced complete functional impairment, and the scaphoid was visibly protruding anteriorly and laterally to the radial styloid. No sensory, motor, or vascular deficits were observed.

Radiological examination (Figures 1A – 1B) indicates dislocation of the scaphoid: the proximal pole appears flattened outside the radial styloid. In profile view, there is anterolateral displacement and verticalization of the scaphoid, without displacement or fracture of the other carpal bones, and with preservation of the ulnar styloid.

The patient was urgently taken to the operating theatre approximately 2 hours after admission. Under hand block anesthesia, an open reduction procedure was performed. This involved traction along the axis of the third finger and direct pressure on the scaphoid with thumb extension and ulnar inclination. Continuous monitoring under image intensifier revealed a scapholunate diastasis exceeding 3 mm. Consequently, the scaphoid was stabilized using two Kirschner wires, one across the scapholunate joint and the other across the scapho-capital joint. Subsequently, the scapholunate ligament was sutured (Figure 2 and Figure 3A).

The lateral view confirmed the restoration of the scaphoid to its proper position (Figure 3B). Following the surgical procedure, treatment was finalized with plaster brachial-antebrachial-palmar cast immobilization for a period of 45 days, followed by a three-month rehabilitation program.

Fig 1A - 1B: Radiographs demonstrating isolated anterolateral dislocation of the metacarpal scaphoid

Fig 2: Scaphoulnate ligament using a posterolateral approach

Fig 3A - 3B : Fluoroscopie intra-opératoire montrant la fixation par fil de Kirschner

3. DISCUSSION

In the scenario described, these dislocations occur when the wrist is in a closed position. The abrupt hyperextension and ulnar deviation lead to the tearing of the radioscapoid and scapholunate ligament, resulting in the scaphoid bone being ejected in both radial and palmar directions [1].

Understanding the anatomical and biomechanical characteristics of the peri-scaphoid ligaments is crucial for comprehending dislocations. Stabilization of the proximal pole is primarily insured by the radioscaphocapital, scapholunate and radioscapholunate ligaments. Conversely, the Scaphoid-Trapezium and scaphocapital ligaments, on the other hand, stabilize the inferior pole.

Indeed, it's the severity of these ligament injuries that will dictate the reducibility and stability of the carpus. As a result, treatment options for these isolated carpal dislocations may include:

- Non-surgical approach: Reduction followed by immobilization in a plaster cast for approximately six weeks.
- Surgical intervention: Reduction and open fixation typically performed through a posterior approach, as in the described case.

Scapholunate diastasis can indeed lead to misalignment, such as dorsal angulation of the semilunate and palmar flexion of the scaphoid. Mayfield *et al*., [15], highlight the challenge in correcting this misalignment: closing the scapholunate angle often requires radial space, while achieving proper scapholunate angulation typically necessitates ulnar deviation.

Fixation of the scapholunate joint using Herbert screws is advised, aiming to achieve the following objectives:

- Scapholunate distance reduced to less than 3mm.
- Angulation corrected to approximately 60 degrees.

Furthermore, Szabo [16], Andre [17], and Amamilo [18] recommend a systematic approach to percutaneous pinning of the scapholunate and scaphocapital joints after reduction has been achieved. Horton *et al*.,'s findings indicated that scapholunate ligament reconstruction led to outstanding anatomical and functional results. - In instances of failure, capsulodesis and tenodesis procedures are employed. Wrist arthroscopy facilitates the assessment of individual ligaments and offers various surgical options.

Delayed diagnosis raises the probability of necessitating open reduction and impacts the eventual outcome by contributing to wrist stiffness and arthritis [19]. According to Higgs, open reduction is recommended if the diagnosis is made after 6 weeks [14]. However, Walker suggests open reduction after 5 days or in cases of non-reducible dislocation.

One year follow-up, the patient revealed no signs of wrist instability (Figure 4). The patient exhibits approximately 80 degrees of flexion, 70 degrees of extension, 40 degrees of adduction, and 20 degrees of abduction. Pronation and supination are equal. The patient has regained their activity level and is content with the outcome.

The absence of radiological signs of osteonecrosis can be attributed to the persistence of branches of the scaphotrapezoid ligament and capsule [8] (Figure 5).

Fig 4: Wrist range of motion after one year of recovery

Fig 5: Radiographs showing no signs of osteonecrosis

4. CONCLUSION

Isolated scaphoid dislocations are rare. Open reduction and ligament fixation are currently the preferred treatments, with the choice of surgical approach determined by the location of the dislocation. Early diagnosis leads to timely management, resulting in a positive prognosis for patients.

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