

Revista Española de Cirugía Ortopédica y Traumatología

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CASE REPORT

Palmar scaphoid dislocation associated with dorsal perilunate dislocation. A case report and review of the literature[☆]

J.M. Gómez Fernández^{a,*}, J.M. Mendez López^a, P. Grau Galtés^b, F. Caracuel Redondo^c

^a Unidad de Mano y Nervio Periférico, Servicio de Cirugía Ortopédica y Traumatología, MC-Mutual, Hospital Sagrat Cor, Barcelona, Spain

^b Unidad de Cirugía Ambulatoria, Servicio de Cirugía Ortopédica y Traumatología, MC-Mutual, Hospital Sagrat Cor, Barcelona, Spain

^c Servicio de Rehabilitación, MC-Mutual, Hospital Sagrat Cor, Barcelona, Spain

Received 11 September 2012; accepted 4 December 2012

KEYWORDS

Carpal scaphoid;
Scaphoid dislocation;
Perilunate dislocation

PALABRAS CLAVE

Escafoides carpiano;
Luxación del
escafoides;
Luxación perilunar

Abstract Most carpal dislocations occur in the lunate bone or around it (perilunate). An isolated dislocation of the carpal scaphoid is a rare injury. We report a case of a palmar scaphoid dislocation combined with a dorsal perilunate dislocation, which was treated with open reduction, fixed with two Kirschner wires and ligament repair, with a good result.

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Luxación palmar del escafoides carpiano asociado a una luxación perilunar dorsal. A propósito de un caso y revisión de la bibliografía

Resumen La mayoría de las luxaciones del carpo ocurren en el semilunar o a su alrededor (perilunar). La luxación aislada del escafoides carpiano es una entidad rara. Presentamos un caso clínico de luxación palmar del escafoides asociada con una luxación perilunar dorsal, tratado con reducción abierta, y estabilizado con 2 agujas de Kirschner y reparación ligamentosa, con buen resultado.

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Introduction

Scaphoid dislocation without associated fracture or dislocation of other carpal bones is a rare lesion. A total of 39 cases can be found in the literature,^{1–15} mainly in English. However, the association of palmar dislocation of the scaphoid and dorsal perilunate dislocation is extremely rare, with only 1 published case report¹⁶ and 1 letter.¹⁷ We report a similar case, the treatment

[☆] Please cite this article as: Gómez Fernández JM, et al. Luxación palmar del escafoides carpiano asociado a una luxación perilunar dorsal. A propósito de un caso y revisión de la bibliografía. Rev Esp Cir Ortop Traumatol. 2013;57:140–4.

* Corresponding author.

E-mail addresses: jgomezf@mc-mutual.com, jgofecot@gmail.com (J.M. Gómez Fernández).

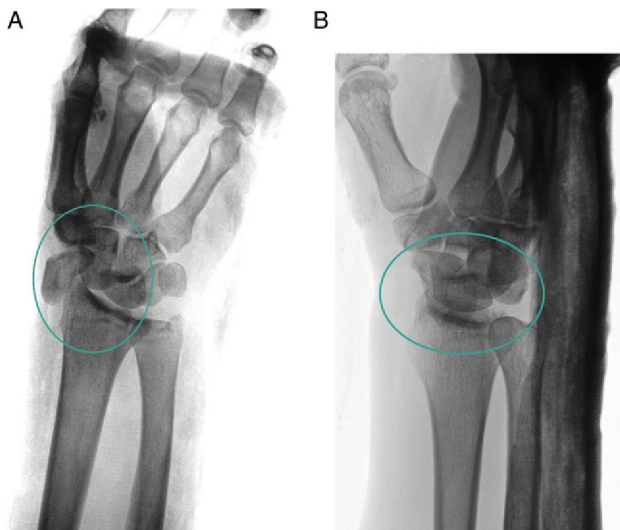


Figure 1 (A and B) Radiographic aspect of the lesion.

performed and the clinical, functional and radiographic results obtained.

Case report

The patient was a right-handed, 48-year-old, male construction worker. He suffered multiple injuries due to a fall from 5 meters. On his right hand he suffered a palmar and radial scaphoid dislocation associated to a dorsal carpal perilunate dislocation (Fig. 1A and B). He was initially treated by closed reduction and immobilisation of the wrist with a plaster cast. Radiographic control after reduction revealed the existence of residual scapholunate diastasis (Fig. 2A and B), with the remaining carpal bones in a correct anatomical location. At 15 days after the trauma, he underwent surgery through a dorsal approach between the third and fourth compartments and radiocarpal capsulotomy, confirming diastasis and the existence of useful scapholunate ligament stumps. We used 2 Kirschner wires, 1 in the lunate and 1 in the scaphoid, as a lever for articular reduction of the pathological scapholunate separation, posterior stabilisation with 2 Kirschner wires (1 scapholunate and 1 scaphocapitate), repair of the dorsal scapholunate ligament remains through reinsertion into the scaphoid supported by bone mini-anchoring and Blatt capsulodesis (Fig. 3A and B). Following closure of the wound, the wrist was immobilised with a forearm cast. The immobilisation cast and Kirschner wires were removed at 8 weeks after surgery and a removable wrist strap was adapted for 3–4 weeks. Rehabilitation treatment was also started at this time.

Results

In a review after 8 months, the wrist presented an excellent clinical appearance. Articular balance, as measured with a goniometer, was slightly reduced, with flexion/extension of 65/60° vs 80/70° in the healthy wrist. The patient only reported pain in the last degrees of joint mobility, without joint cracks or ridges. The radiographic study found no



Figure 2 Radiographic control after reduction. Evidence of scapholunate diastasis.

images suggestive of carpal instability. After assessment of sequelae, the patient returned to his usual activity.

At 18 months follow-up, the radiographic study showed a normal carpal alignment, without any intercarpal instability or images suggesting necrosis of the carpal bones and without secondary degenerative changes (Fig. 4A and B). The patient reported no pain during daily life activities and only manifested some discomfort during considerable efforts. The clinical appearance of the wrist was normal, with no apparent signs of inflammation. The articular balance of the wrist was 70° flexion, 60° extension, 40° ulnar tilt and 15° radial tilt (mobility of the healthy wrist was 80, 70, 50 and 15°, respectively). An isokinetic test performed on both wrists noted a normalisation of grip strength values, without any significant quantitative deficits.

Discussion

The present case is a rare lesion, or one scarcely reported in the literature, consisting of a closed dislocation of the carpal scaphoid associated to a dorsal perilunate dislocation of the carpus.

Dislocations of the carpal scaphoid are rare injuries,^{1–15} with 39 cases reported in the literature since 1930, mostly in English. These lesions are divided into 2 types: isolated dislocations (type 1) and dislocations associated with axial disruption of the capitolunate joint (type 2).^{10,11} The classification of isolated scaphoid dislocations in these 2 types is very interesting, but reality shows that it is limited, since many carpal lesions are more complex and cannot be classified into any of these 2 groups. Often, they even require complementary examinations, such as computed tomography (CT) or magnetic resonance imaging (MRI) scans, in order

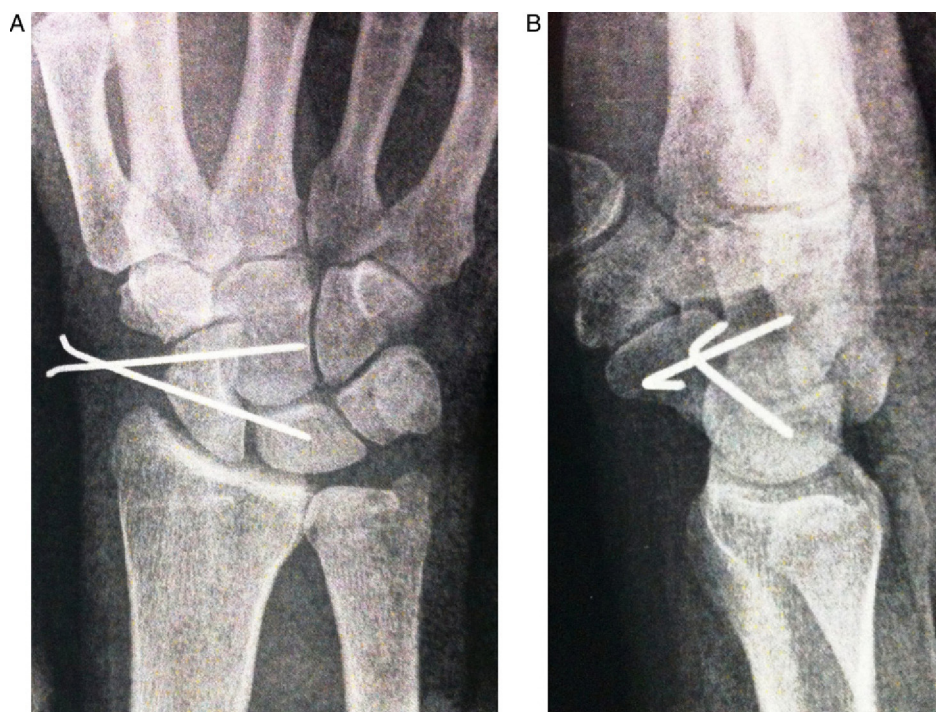


Figure 3 (A and B) Radiographic image in the immediate postoperative period.

to detect some lesions which are not observed through a radiographic study.¹⁸ Other authors, such as Leung et al.,⁸ classify these lesions into simple (isolated) or complex (when the distal carpal row is included). Moreover, they may be total (palmar or dorsal) or partial (the proximal pole of the scaphoid moves in a radial, palmar or dorsal direction, maintaining the powerful scaphotrapezial ligamentous joints).

The exact mechanism of injury of this lesion is still controversial, but it is usually caused by a dorsiflexion force and ulnar deviation of the wrist, with or without rotational forces.⁸

Conventional treatment options include closed reduction and immobilisation with a cast³ or closed reduction and stabilisation with percutaneous Kirschner wires.^{12,13} Numerous cases report good functional results. We should note that

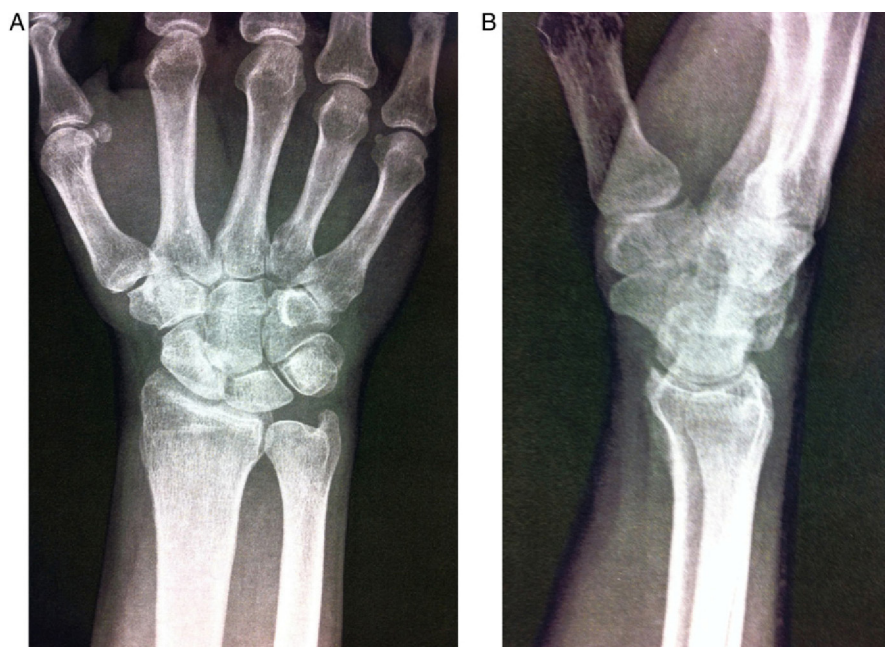


Figure 4 (A and B) Radiographic image at 18 months.

evolution is not the same in complete, isolated, scapholunate instability as in complex trauma with scapholunate diastasis associated to other carpal and carpometacarpal lesions. It is somewhat paradoxical, but in multiple lesions it is likely that the massive reactive fibrosis (and the unavoidable functional limitation), hinders the development of a carpal collapse process (scapholunate advanced collapse or SLAC) as severe as in complete, isolated, scapholunate instabilities (primarily in those that go unnoticed or are poorly treated). This may explain the good results reported in the literature for cases treated conservatively or with closed methods.

Dislocation or instability secondary to closed reduction and stabilisation with Kirschner wires has led many authors to advocate for primary repair through open reduction and ligament repair.^{5,6,9}

In a retrospective study conducted by Inoue and Maeda,¹ primary ligamentous repair and internal fixation with Kirschner wires managed to maintain the anatomy of the scapholunate joint and produce better results than closed methods. In a case report, Horton et al.⁹ suggest that ligament repair offers excellent anatomical and functional results in the context of isolated scaphoid dislocation.

The risk factor with the worst prognosis is diagnostic and therapeutic delay.^{8,12}

The present case involved a palmar dislocation of the carpal scaphoid associated to a dorsal perilunate dislocation. This was the second case published in the literature.¹⁷ Early diagnosis of this lesion is very important in multiple trauma patients, among whom it may easily go unnoticed. Moreover, initiating treatment immediately also facilitates closed reduction. In our opinion, the treatment of choice is that advised by contemporary authors for isolated lesions, that is, primary ligament repair and stabilisation with Kirschner wires. However, there are no comparative analyses with the results obtained by conservative treatment which confirm this assertion.

Few complications have been described in scaphoid dislocations. The most common complication is scapholunate instability or dissociation, with or without subluxation or instability in flexion of the scaphoid,^{5,10} although in some cases it could be related to insufficient reduction.⁵ At present, only 1 case of avascular necrosis of the scaphoid has been published.¹⁹

We opted for the surgical option through a dorsal approach, with scapholunate capsuloligamentous and dorsal radioscaphoid (capsulodesis) repair, along with internal fixation using Kirschner wires. Lee et al.,¹⁶ due to a delay in reduction (failure of the first attempt at closed reduction on the same day of the injury), had to use a volar approach to conduct anatomical restitution of the displaced scaphoid and also had to perform decompression of the median nerve, which was severely affected, as could be observed clearly on the CT scan. Obviously, this approach did not allow repair of the dorsal ligaments. Nevertheless, they reported an almost complete recovery of wrist mobility. However, the radiographs at 24 months after surgery showed scapholunate diastasis, lunocapitate degenerative changes and scaphoid malposition. The radiographic results in our case were highly acceptable, without any degenerative changes or carpal instabilities, although we must emphasise the short follow-up period (18 months).

Furthermore, the good functional results obtained were surprising, since the articular balance was very close to that of the contralateral wrist (<10°) despite Blatt capsulodesis, which is known to prevent scaphoid subluxation at the expense of generating a limitation of wrist flexion of about 20°.²⁰ This fact may well be due to inefficiency or failure, or to the attainment of sufficient tissue elasticity to reach that articular range.

Level of evidence

Level of evidence IV.

Ethical responsibilities

Protection of human and animal subjects. The authors declare that this investigation did not require experiments on humans or animals.

Confidentiality of data. The authors declare that they have followed the protocols of their workplace on the publication of patient data and that all patients included in the study received sufficient information and gave their written informed consent to participate in the study.

Right to privacy and informed consent. The authors declare having obtained written informed consent from patients and/or subjects referred to in the work. This document is held by the corresponding author.

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