TRAUMATIC SCAPHOLUNATE DISSOCIATION - CASE REPORT

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TRAUMATIC SCAPHOLUNATE DISSOCIATION - CASE REPORT (Abstract): Perilunate injuries occur after an impact trauma to the wrist. The recognition of these lesions and immediate treatment are the two essential conditions to ensure the best possible outcome. The first therapeutic step is the restoration of anatomical joint relationships of the carpus followed by percutaneous pinning or internal fixation required for maintaining the congruence this segment. Despite correct diagnosis and approach in these cases the prognosis is often encumbered by decreased range of motion, loss of grip strength and finally the onset of osteoarthritis. Scapholunate dissociation is the most frequent pattern of carpal instability. We report the case of a 53-year-old woman diagnosed with scapholunate dissociation resulting from an injury caused by fall from the same level on the outstretched right hand (dominant hand). Surgery was performed 48 hours post-injury and consisted in external reduction followed after the restoration of the anatomical joint relationships in the right wrist by percutaneous pinning. Postoperatively the wrist was immobilized in brachipalmar cast for 8 weeks and arthrosynthesis pins were removed. The patient was reassessed at 6 months postoperatively by clinical and radiological evaluations and the functional outcome was good. Key words: SCAPOLUNATE ANGLE, CAPITOLUNATE ANGLE, TERRY THOMAS SIGN, SCAPHOLUNATE DISSOCIATION, ROTATORY SUBLUXATION OF THE SCAPHOID.

Scapholunate dissociation is a ligament injury of the wrist which causes the loss of normal alignment between the scaphoid and lunate bones due to partial or complete injury to the scapholunate interosseous ligament and extrinsic ligaments with a role of secondary stabilizers of this segment. This pathology is frequently under diagnosed being misdiagnosed as simple wrist sprain. The occurrence of carpal instability leads to biomechanical changes and favors the occurrence of arthrosic lesions and ultimately of scapholunate advanced collapse finally (SLAC) wrist. The dissociation is also accompanied by rotatory subluxation of the scaphoid bone. Wrist arthroscopy allows the visualization of the scapholunate space and has become a standard method useful for both the diagnosis and management of this condition.

CASE PRESENTATION
A 53-year-old woman presented to the emergency unit following an injury occurred on the same day by fall from the
same level on the right hand (dominant member) with the wrist in hyperextension. Physical examination revealed a moderately diffuse edema over the dorsal aspect of the right wrist and hand, diminution of grip strength and antalgic restriction of active movements. The scapholunate interval was identified by palpation as the point of maximum pain intensity and the scaphoid shift test revealed the presence of scapholunate instability. Neuro-vascular examination revealed no changes in the radial artery and median nerve territory. The patient had a non-pathological personal history and routine laboratory investigations were within normal ranges.

As first-line imaging investigation bilateral wrist X-rays in anteroposterior, lateral and oblique views were performed, later supplemented by CT scanning. Anteroposterior X-rays showed the increase in scapholunate interval to 4 mm (positive Terry Thomas sign) and rotatory subluxation of the scaphoid. At the level of radial styloid apophysis a fracture line without displacement was identified. Profile X-ray revealed a scapholunate angle value of 80° (normal 30-60°) and a capitolumate angle of 40° (normal 20°) (fig.1).

For comparison X-rays of the contralateral wrist were performed and these showed a scapholunate space within normal range and the correct orientation of the semilunate and scaphoid bones (fig. 2).

![Fig. 1. X-ray appearance of the right wrist](image1)

![Fig. 2. Normal articular relationships in the contralateral wrist](image2)

Standard radiological examination showed the presence in both wrists of a risk factor reported in the literature, namely ulna minus configuration (1).

Computed tomography confirmed the diagnosis of scapholunate dissociation showing an unevenly increased scapholunate joint space, more pronounced posteriorly, of up to 7 mm, anterior semilunate subluxation, and the presence of a bony fragment of 4/2/ 4mm resulting from ligament avulsion. Similar millimetric frag-
ment were seen on the posterior margin of the radial epiphysis (1.4 / 3.4 / 2.5 mm) and volar aspect of the distal radioulnar joint adjacent to the radius (2/1.4/2.8 mm) (fig. 3, 4).

The intervention consisted of percutaneous pinning under locoregional anesthesia (supraclavicular block). The semilunate was repositioned by wrist flexion followed by temporary stabilization to the radius with a 1.2 mm Kirschner pin. Scaphoid position was corrected by wrist-extension maneuver and was maintained with two pins percutaneously driven into the semilunate and from the scaphoid into the big bone, respectively (fig. 5).

Postoperatively the wrist was immobilized in neutral position with a brachial-palmar cast for 8 weeks. Periodic radiological controls confirmed the preservation of normal joint relationships and the correct pin positioning which were removed after 8 weeks.

Clinical and radiological reassessment at 6 months postoperatively showed regional osteoporosis without indicating the onset of avascular necrosis at the carpal bones but dorsal intercalated segment instability (DISI) deformity was observed. Grip strength in the right hand was determined and was 70% of the contralateral side. Capito-lunate angle was 30°, scapholunate angle 60°, active flexion 50°, and active extension 60° (fig. 6).

Fig. 3. CT scan of the right wrist

Fig. 4. Three-dimensional reconstruction of the right wrist
DISCUSSION

Intracapsular ligaments of the wrist are classified into intrinsic and extrinsic. Scapholunate and lunotriquetral ligaments are the most important intrinsic ligaments each being composed of three fascicles (dorsal, palmar and proximal). Scapholunate interosseous ligament is considered the primary stabilizer of this joint and its dorsal portion represents the area of maximum strength while the lunotriquetral ligament is more prominent on the palmar side (2).

The presence of secondary stabilizers represented by the extrinsic ligaments of the wrist makes that an isolated lesion of the dorsal fascicle of the scapholunate ligament to determine in the worst case dynamic instability of this segment (seen only on stress radiographs) without a resulting static scapholunate dissociation seen on standard radiographs (3).

In the palmar area strong radiocarpal ligaments which are secondary stabilizers are identified: the radioscapohamate, the radioscapohamate ligament, long and short radiolunate ligaments. The radioscapohamate ligament originates from the radial
Traumatic scapholunate dissociation - case report

The styloid process, crosses the body of the scaphoid and inserts distally into the palmar aspect of the capitate bone, acting as a fulcrum around which the scaphoid rotates. The radioscapopholunate ligament, also called the ligament of Testut, also has the role of stabilizing the scaphoid and neurovascular pedicle being connected with the radial artery, anterior interosseous artery and anterior interosseous nerve (4).

Scapholunate dissociation is the first stage of perilunate instability and results from injury to the scapholunate interosseous and palmar radioscapophocapitate ligaments which bring the semilunate in extension while the scaphoid flexes and pronates. Mayfield et al. describe the application of impact force to the hypothenar region of the hand with the wrist in extension and ulnar deviation as the main mechanism of action. As the impact force amplifies, the ligaments and bones of the wrist are injured in a circumferential direction around the semilunate and in the radioulnar direction (5).

Ligament injury is often accompanied by scaphoid fracture without displacement or fracture of the radial styloid apophysis. Scapholunate dissociation occurs only when injury to the scapholunate ligament is accompanied by injury to the secondary stabilizers. Incongruous joint relationships determine changes in biomechanics and load concentration at certain points resulting in the occurrence of scapholunate advanced collapse (SLAC) and development of degenerative arthritis. Patients diagnosed with scapholunate dissociation may present preexisting generalized ligamentous laxity (6).

Conservative treatment is of limited value for this type of lesion being currently abandoned due to the loss of reduction that most often occurs. Although semilunate extension can be easily corrected by wrist flexion, this will accentuate the vicious position of the scaphoid, and thus there is not an ideal position for immobilization. Surgery remains the correct option and is recommended to be performed within the first 3 days (7, 8).

If reduction is easily obtained and maintained percutaneous pinning combined with immobilization for a minimum of 8 weeks is an important therapeutic resource. Most authors recommend the use of two pins, both passed through the scaphoid and advanced into the semilunate and capitate bone, respectively. Scapholunate joint reduction can be easily achieved by the insertion of two pins into the scaphoid and lunate and used as joysticks. The intervention is facilitated by arthroscopic control. Whipple (9) reported an 85% success rate in maintaining scapholunate reduction in patients with a scapholunate interval greater by 3 mm than the contralateral wrist if surgery was performed within the first 3 months. Despite early diagnosis and correct treatment radiological revaluations reveal in over half of the operated patients the onset of wrist osteoarthritis whose treatment requires such difficult and debilitating reinterventions as proximal row carpectomy and wrist arthrodesis (10).

CONCLUSIONS

Scapholunate dissociation remains a complex pathology both in terms of diagnosis and especially of treatment. In our patient reduction by external maneuvers followed by percutaneous pinning provided good functional and radiological outcomes. No changes, such as avascular necrosis of the carpal bones were present but a dorsal intercalated segment instability (DISI) persisted.
REFERENCES


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**NEWS**

DYNAMIC OBSTRUCTION OF THE LEFT MAIN CORONARY ARTERY OSTIUM BY A PAPILLARY FIBROELASTOMA

Benign tumours of the heart are usually detected as incidental findings during echocardiography. Most cases are intracardiac tumours, with myxoma being the most frequent entity. There are reported images of a patient with acute myocardial infarction and a concomitant extracardiac benign tumour, consisting in fibroelastoma in the aortic root. Papillary fibroelastoma is the second benign tumour of the heart. It is a rare intracardiac tumor, with rather high risk of embolization. It usually originates from the aortic and mitral valve. Extracardiac, as observed in the reported case, is very rare and searching the lesion as a cause of acute coronary ischemia identification is needed (Napp LC, Baraki H, Bredt M, et al. Dynamic obstruction of the left main coronary artery ostium by a papillary fibroelastoma. *Cardiovascular Pathology* 2014, 23: 57-58).

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