Scapholunate instability – a spectrum of pathology

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Abstract

Five cases of scapholunate instability are reported. The condition is commonly misdiagnosed in accident and emergency departments. The importance of a complete clinical assessment of the suspected scaphoid injury and the need to measure the scapholunate distance and the scapho-
Scapholunate angle on the radiographs is stressed.

Key terms: scapholunate instability; assessment; diagnosis

Scapholunate instability is uncommon and is often misdiagnosed as a “bad sprain” at first presentation.1 2 The clinician must have a high index of suspicion for this condition when significant wrist pain and swelling follow an acute injury, as the diagnosis may not be obvious from standard radiographs. Failure to detect the condition early results in disability and secondary osteoarthrosis of the wrist joint.3 4 We present five cases with a review of the literature.

Case reports

CASE 1
A 73 year old woman presented to accident and emergency (A&E) after she fell onto her outstretched right hand. Examination revealed swelling over the dorsoradial aspect of the wrist, with distinct tenderness over the dorsum of the scaphoid and in the anatomical snuffbox. A PA radiograph showed scapholunate dissociation (fig 1), and this was confirmed clinically by a positive “scaphoid shift test”. In view of her age the patient was managed conservatively in a scaphoid plaster of paris (POP) for six weeks. Two months later she had good grip strength and minimal symptoms.

CASE 2
A 37 year old man sustained a right wrist injury when he punched someone. He presented to A&E 16 days after this incident as his wrist was still swollen and painful. X rays revealed a fracture of the proximal pole of the scaphoid (fig 2A) and he was treated with a scaphoid POP for eight weeks. Following this he complained of persistent pain and stiffness in the wrist for several months. A clenched fist x ray revealed a scapholunate dissociation and apparent non-union of the fracture (fig 2B), and thus he underwent exploration of the joint. At this point the fracture had united, but there was a complete disruption of the scapholunate ligament. This was repaired, but continuing pain and loss of function necessitated a limited wrist arthrodesis.

CASE 3
A 21 year old woman injured her right hand and wrist in a fall and complained of bruising and swelling of the thenar eminence. Standard scaphoid x rays were normal but in view of tenderness in the anatomical snuffbox she was placed in a scaphoid POP. On review 10 days later it was noted that there was some painless scapholunate instability, and a mild scapholunate diastasis was evident on a clenched fist view. As her symptoms originated from the thenar eminence as opposed to the scaphoid area, a magnetic resonance scan was performed. This showed the scapholunate diastasis but no evidence of recent injury in that area. The patient could not recall any significant wrist injury in the past and was therefore diagnosed as having a congenital ligament laxity.

CASE 4
A 90 year old woman injured her right wrist when she fell onto her outstretched hand. Examination revealed dorsal wrist swelling and scaphoid tenderness, and the x rays were interpreted at that time as being normal apart from an erosive arthropathy. She was treated with a POP backslab and at review five days later a scapholunate dissociation and a fracture of the tubercle of the scaphoid were diagnosed (fig 3). In view of her advanced years she was managed conservatively in a scaphoid POP splint for six weeks.

CASE 5
A 90 year old woman complained of acute left wrist pain after she pushed up to a standing position from an armchair. On examination, swelling and tenderness indicated a scaphoid injury and x rays showed rotatory subluxation of the scaphoid with a scapholunate angle of 90 degrees (fig 4). Again, in view of her age, she was treated with a scaphoid POP.

Discussion
Scapholunate dissociation has been described in rheumatoid arthritis,5 7 spastic paraparesis,1 and following trauma to the wrist.8 9 Congenital ligament laxity can cause symptomatic10-12 or asymptomatic13 dissociation. An allied condition, rotatory subluxation of the scaphoid, is the result of additional rupture of the volar radiocarpal ligament, causing further instability and a volar tilt of the distal pole of the scaphoid.11

The clinical signs of acute scapholunate liga-

Figure 1 Scapholunate dissociation.
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Figure 3  Scapholunate dissociation with erosive arthropathy.

Figure 2  (A) Fracture of proximal pole of scaphoid. (B) Increased scapholunate distance with clenched fist.

scaphoid fracture, but the “scaphoid shift test” is diagnostic of the former. This test, otherwise known as Watson’s test, is a very sensitive clinical indicator of scapholunate instability. It is performed with the patient’s elbow resting on a table with the forearm held vertically. The operator’s thumb is placed over the patient’s scaphoid tubercle while his fingers wrap around the dorsum of the wrist. The patient’s hand is then put into ulnar deviation and slight dorsiflexion. With the thumb pressing firmly on the scaphoid tubercle, the wrist is moved into radial deviation and volar flexion. This manoeuvre, in the normal individual, tilts the scaphoid in a volar direction, but if there is an acute disruption of the scapholunate ligament the scaphoid will be displaced dorsally by the operator’s thumb, resulting in a painful palpable “thunk”.

Twelve per cent of the population have normal hypermobile scaphoids due to inherent ligament laxity, and differentiation between these and acute ruptures should be clear. The presence of swelling, scaphoid tenderness, and a painful positive Watson’s test are indicative
difficult to treat because the majority of cases are detected late when the intercarpal ligaments have fibrosed. If detected early the treatment of choice is open repair of the ruptured ligaments and K-wire fixation of the scaphoid.21,22 Cases detected after the acute phase which have no radiological evidence of secondary arthritis have been treated with ligament reconstruction using tendon grafts, but the results up to now have been disappointing.23 Late cases with degenerative arthritis require limited wrist arthrodesis,24 wrist implantation arthroplasty, or proximal row carpectomy.25

Correct clinical and radiological assessment of wrist injuries is essential in A&E so that subtle wrist injuries are not missed.26 To avoid the significant morbidity associated with the late detection of scapholunate instability those patients who have clinical signs of a scaphoid injury and normal scaphoid x rays should have the "scaphoid shift" test performed. If this is positive, a clenched fist radiograph with the wrist in supination should be performed and a senior orthopaedic opinion sought.

![Figure 5](https://example.com/image.png)

Figure 5. (A) Normal alignment on lateral view. (B) Increased scapholunate angle with rotatory subluxation of the scaphoid.

of an acute ligament disruption. If doubt remains as to whether a positive Watson’s test is due to congenital laxity or to an acute rupture, assessment of the contralateral wrist is required. An increased scapholunate distance and a positive Watson’s test in the uninjured wrist makes the diagnosis of an acute rupture less likely.

Radiographs provide the diagnosis of scapholunate dissociation in the majority of cases. A scapholunate gap of 2 mm on the posteroanterior (PA) x ray is normal, 2–4 mm is suggestive, and greater than 4 mm (Terry Thomas sign) is diagnostic of scapholunate dissociation.16 Rotatory subluxation of the scaphoid is recognised by a foreshortened appearance of the scaphoid and a ring sign (due to the plane of the distal pole being parallel to the x ray beam) on the PA film, while a dorsal angulation of the lunate and volar tilt of the scaphoid result in an increased scapholunate angle on the lateral film. This angle is calculated by drawing a line through the centre of the distal and proximal poles of the scaphoid, that is, the longitudinal axis, and measuring its angle of intersection with a line drawn through the midpoints of the proximal and distal concavities of the lunate (fig 5). The normal range is from 30 to 60 degrees with a mean of 47 degrees.11

In some cases scapholunate dissociation may not be evident on routine x rays despite a positive Watson’s test. A clenched fist view in supination, a manoeuvre which drives the capitate between the scaphoid and the lunate, may reveal the instability by increasing the scapholunate distance, but it is often restricted by pain. A tangential PA view with 20 degrees of ulnar deviation of the wrist and hand also demonstrates dissociations not seen on routine radiographs.17 Other useful diagnostic tools are cineradiography,18–20 magnetic resonance imaging, and arthroscopy.

Scapholunate dissociation and rotatory subluxation of the scaphoid are particularity