



The Weekly Probe

29th April 2016

Volume 13 Issue 12

THIS WEEK

Carpal dislocations and ligamentous injuries

Joke / Quote of the Week

The Week Ahead

Last weeks case – Carpal dislocations + ligamentous injuries

A 35yo man presents with left wrist pain after falling off the back of a ute. On examination he has diffuse volar and dorsal swelling and tenderness over his carpal bones and evidence of a median nerve sensory deficit.. His X-rays are shown below. What is going on?



This man has a perilunate dislocation associated with a # of the proximal scaphoid and the triquetral. This was reduced under sedation with plans for further investigation with MRI and consideration for ORIF / ligamentous repair. See comment below re perilunate dislocations (Lunate Capitate Scaphoid)

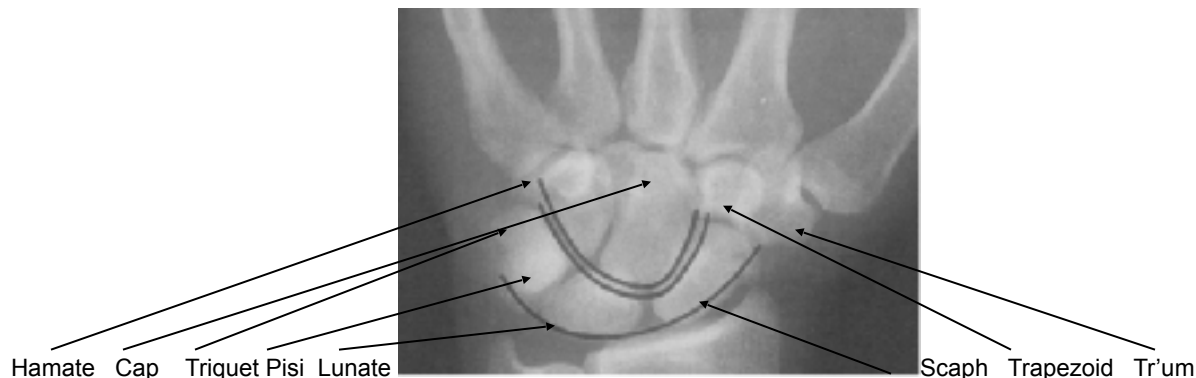
Over the last couple of weeks we've seen 2 similar dislocations and talking to the hands reg he reports another 2 in the last fortnight, one of which was not initially picked up. Although this is an old

article, it summarises all the relevant issues - Meldon "Ligamentous injuries of the Wrist" from Journal of Emergency medicine 1995; 13(2)- if you want a full copy of the PDF let me know.

Wrist Anatomy – the wrist is made up of the radius / ulna articulating with the carpal bones which articulate with the metacarpals. The carpal bones (8) are arranged in 2 rows- (some of you have mnemonics to remember the names such as **Some Lovers Try Positions That They Can't Handle** , but here are some other tips) - proximally the central lunate (moon shaped), the scaphoid on the radial side and the triquetrum (and pisiform) on the ulnar side. / distally the central capitate (with it's head), the hamate (with it's hook) on the ulnar side and the trapezoid and trapezium (which sits near the **thumb**. The scaphoid spans the 2 rows maintaining wrist stability.

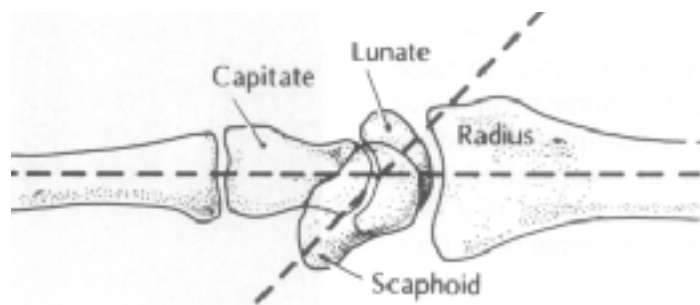
The bones are stabilised by dorsal and volar ligaments which are named for the bones into which they attach. They can be extrinsic , running between the radius / ulna / MCs and the carpal bones , or intrinsic running between the carpal bones. The key ligaments of the wrist are on the volar surface – the radiocapitate (RCL), the radioscaphoid (RSL)and the largest the radiotriquetral lig (RTL)

Xray - **PA** , lateral, oblique +/- scaphoid views. PA view should show 2 rows with each row showing a contiguous arch. All jt spaces should be parallel - 1-2 mm wide and uniform width- c/w below Xray



Note there may be changes with the shape of the scaphoid and lunate with movement of the wrist – the scaphoid may look short with flex'n and radial deviation (but this can occur with ligamentous injuries) while the lunate has a more trapezoidal shape it looks more triangular in flexion and extension. There also should be no overlap between the distal radius and ulna on a properly positioned PA film

Lateral film – the radius, lunate, capitate and 3rd MC are aligned. A line drawn through the axis of the scaphoid should be at a angle of 30 to 60 degrees to the longitudinal axis of the wrist



Carpal injuries

Most common injury is the fall on an outstretched hand (FOOSH) – as the scaphoid maintains stability of the wrist , the force is transmitted through this bone – thus a # of the waist is the most common carpal #. Note you can get a combination of bony and ligamentous injuries so if you see one injury , don't switch off and keep looking

However there may be carpal instability without a # - also note that instability may be static ie all the time & seen on xrays -, or dynamic, only being reproduced during excessive loads, thus being difficult to diagnose.

Perilunate and Lunate dislocations

Via excessive hyperextension resulting in tears to the scapholunate, RSL, RTL and RCL lig – resulting in scapholunate dissociation through perilunate to lunate dislocation, +/- triquetrals or radial styloid avulsion #.

Editor: Peter Wyllie

On exam there is dorsal wrist swelling and decreased ROM esp flexion- can be subtle. In lunate dislocations there may be median nerve symptoms as the lunate sits anteriorly

a) Perilunate

Pictures c



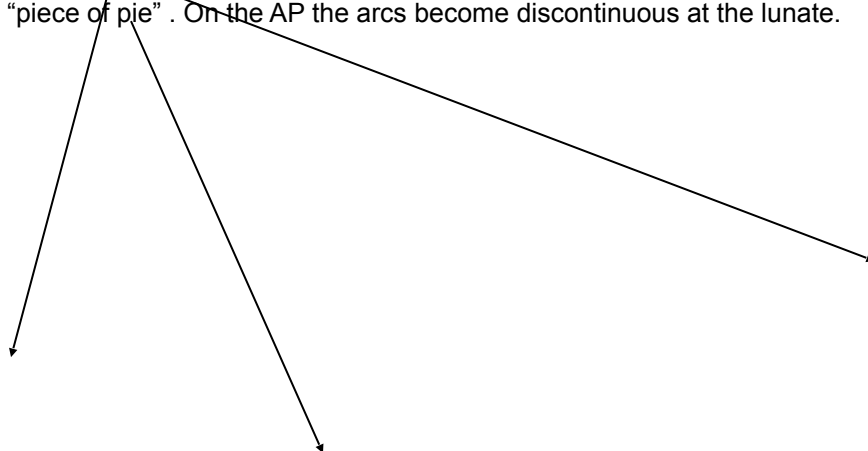
Picture D



Rad lun Cap MC

Here the lunate remains aligned with the radius yet the capitate and distal carpus are dislocated dorsally- best shown on the lateral view. The double headed arrow is where the capitate should sit. However the PA view will also show overlap of the proximal and dorsal rows- compare this to the first Xray above .

Lunate Dislocation – here the lunate dislocates anteriorly (volarly) while the capitate remains aligned with the radius. Subsequently on the lateral view the lunate is located anteriorly and tilts forward like a “spilled teacup”. On the PA view, instead of being trapezoidal , it becomes triangular like a “piece of pie” . On the AP the arcs become discontinuous at the lunate.





Lateral

PA

CT with sagittal recon

The double headed arrow is where the lunate should be sitting.

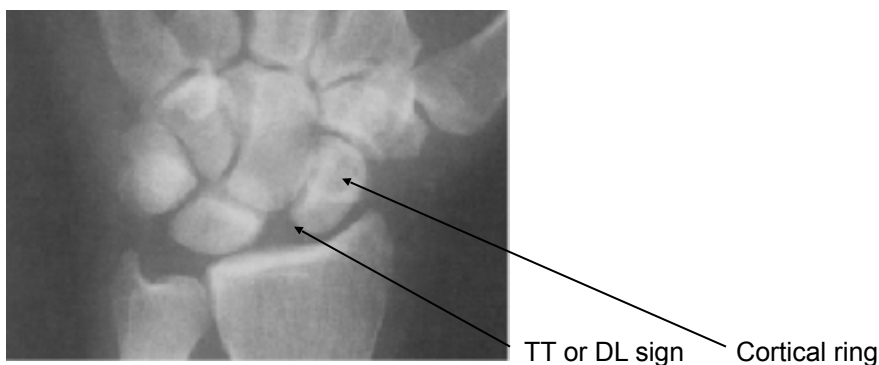
Note that both injuries may be associated with scaphoid # or rotatory subluxation of the scaphoid + radial styloid or triquetral avulsion #.

The treatment for both is closed reduction and immobilisation yet ORIF may be required +/- carpal tunnel release- may be associated however with chronic instability.

Scapholunate Dissociation – forced wrist extension leads to widened scapholunate joint- presents as wrist pain and swelling esp at extremes of movement- may note crepitus or snapping. On exam – palpable clunk in wrist + mild swelling or tenderness dorsally. On the PA film there is widening of the scapholunate joint- a gap of > 3mm is pathognomonic. For the oldies out there this was called the “terry Thomas” signs after a British comedian with a wide gap between his front teeth but is more widely now known as the “David letterman sign” for the same reasons. Occasionally to accentuate the xray findings do comparison views with the patient tightly clenching their fists – this brings the capitate proximally making the gap wider – ulnar deviation may also widen the gap. May be seen with rotatory subluxation of the scaphoid, perilunate or lunate dislocations.

Rotatory subluxation of the scaphoid When the ligamentous injury involves the radioscaphoid ligament, the scaphoid become unstable and rotates in a palmar direction.

On the lateral view the scaphoid perpendicular to the longitudinal axis made up of the radius-lunate-capitate-MC with the scapholunate angle being > 60 degrees. Subsequently on the PA view rather than being elongated, the scaphoid appears shortened , rounded with a dense ring shaped image around the distal perimeter- the “cortical ring”.

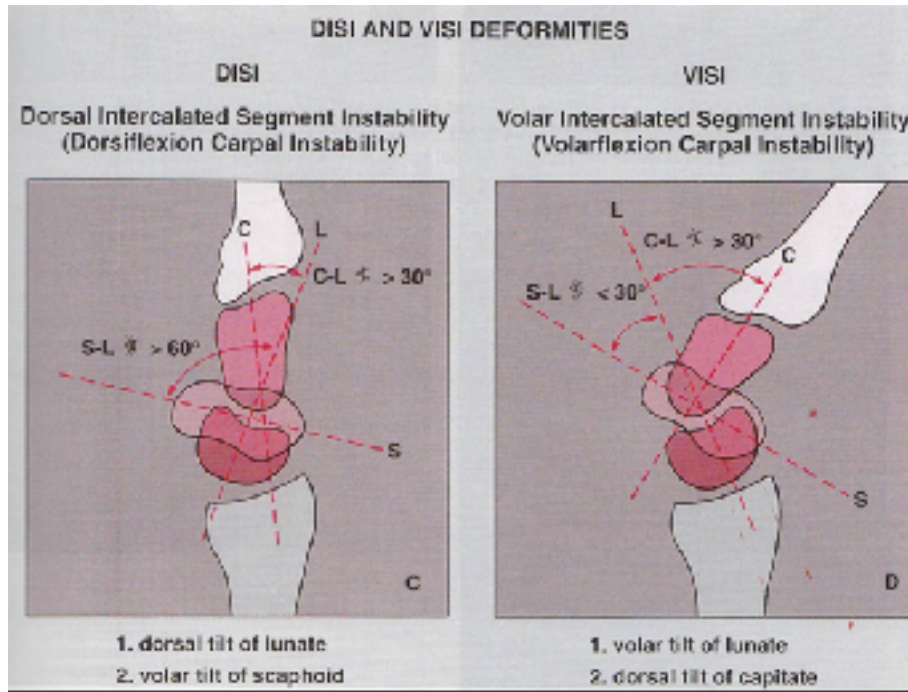


Refer for closed reduction or ROIF with 6 weeks of immobilisation. If untreated may result in ongoing instability, arthritis and ultimately a SLAC wrist (scapholunate advanced collapse.)

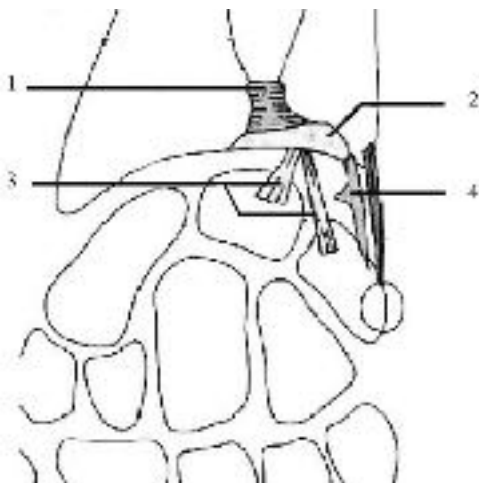
Carpal Instability – can present acutely or late. Results in instability with a zig-zag deformity as the lunate tilts dorsally of volarly and loses its relationship with the capitate. Suspect if persistent discomfort , weakness or crepitus – may have clunks with movement.

- a) **DISI** – dorsiflexed segment instability – when the lunate dorsiflexes on the lunate and the capitate compensates with palmar flexion – Commonly follows scaphoid # or unrecognised scaphoid rotatory subluxation.
- b) **VISI** – volar intercalated segment instability- when the lunate volar flexes and the capitate tilts dorsally – usually indicates lunotriquetral lig injury or mid carpal instability but occasionally in normal people with lax ligaments.

The picture below demonstrates the general idea.



TFCC injuries - The TFCC is a convergence of structures on the ulnar side of the wrist which serve to support the ulno-carpal articulation and stabilise the distal radioulnar joint (DRUJ). It includes the triangular fibrocartilage (2), the dorsal and volar radioulnar lig (1), ulnar meniscus (4), ulnolunate (3) and ulnotriquetral lig (4) and part of extensor carpi ulnaris tendon. Functionally it provides a smooth articular surface between the radius and ulna, transmits and absorbs loads across the ulnocarpal articulation and contributes stability to the ulnar wrist and DRUJ.



Most injuries result from axial loading or fall onto the extended/ ulnar deviated wrist. Sometimes pain may be subtle with c/o pain only during specific sports related activity eg diving, gymnastics or racquet sports. It can be associated with distal radial or ulnar styloid #s.

On examination there may be tenderness and swelling of the dorsal ulnar aspect of the wrist, pain on resisted wrist dorsiflexion or ulnar deviation. Pain with supination or pronation. Later on you may try a TFCC compression test with axial loading and ulnar deviation.

The initial examination is Xrays which later on may show ulnar / radial styloid mal or non-union. If there is associated distal radioulnar instability, the distal ulnar head may sublux posteriorly (or less

Editor: Peter Wyllie

commonly in a volar direction. However the investigation of choice is MRI or arthroscopy. Treatment includes bracing, local physiotherapy and referral for arthroscopy and operative repair.

JOKE / QUOTE OF THE WEEK



Please forward any funny and litigious quotes you may hear on the floor (happy to publish names if you want)

THE WEEK AHEAD

Tuesdays - 12:00 – 13:45 Intern teaching -Thomas & Rachel Moore

Wednesday 0800-0900 Critical Care Journal Club. ICU Conf Room / 12.00-1.15 Resident MO in Thomas & Rachel Moore

Thursday 0730-0800 Trauma Audit. Education Centre / 0800-0830 MET Review Education centre / 1300-1400 Medical Grand Rounds. Auditorium.