



EM CASES SUMMARY

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Episode 52 – Commonly Missed Uncommon Orthopedic Injuries

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Perilunate Injuries

Q: What spectrum of injuries occur in perilunate injuries?

The spectrum of injuries that usually result from a FOOSH mechanism range from the least significant scapholunate dissociation to the most significant lunate dislocation:

1. **Scapho-lunate *dissociation*** – a ligamentous injury with minimal clinical findings and a gap on the AP x-ray of the wrist between the scaphoid and the lunate (The Terry Thomas, or David Letterman or Madonna sign); this the most common cause of SLAC (scapholunate advanced collapse).
2. **Perilunate *dislocation*** – with advancement of injury, the capitate dislocates from the lunate fossa.

3. **Lunate *dislocation*** occurs with further advancement of this injury, which is a volar dislocation of the lunate out of the 'seat' of the capitate.

Q: Why are perilunate dislocations commonly missed?

Swelling and deformity are often absent on exam. The x-ray findings can be very subtle.

Q: What should you be looking for on the AP x-ray for perilunate injuries in general?

1. On the AP x-ray of the wrist, think of carpal bones as flagstones that should have equal distances of 1-2mm between them. Any narrowing/overlap or widening between carpal bones should make you suspicious of a serious perilunate ligamentous injury. If you can't 'drive a car around the bones' then you should suspect a perilunate injury.
2. There are typically 3 smooth Gilula lines (fig 3), which form arcs between the rows of carpal bones. These lines should be smooth, if there any steps or disruption of these lines, you need to consider a perilunate ligamentous injury.

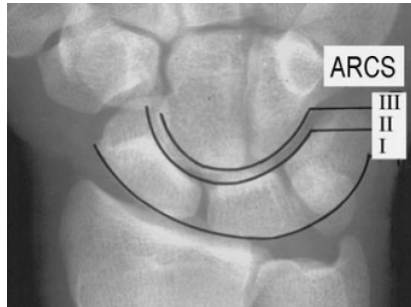


Fig 3: Normal Gilula lines

Q: What is the main x-ray finding of a scapholunate dissociation?

A gap between the scaphoid and lunate on the AP x-ray of the wrist of $>3\text{mm}$ is a scapholunate dissociation until proven otherwise. This x-ray finding has been described as The Terry Thomas Sign and the David Letterman Sign as well as the Madonna Sign as all 3 of these famous entertainers have a gap between their two front teeth.



Fig 4: Terry Thomas Sign of Scapholunate Dissociation

Q: What are the main x-ray finding for a perilunate dislocation and lunate dislocation on x-rays of the wrist?

On the AP x-ray of the wrist, there is crowding of the carpal bones such that the normal 1-2mm of space in between the carpal bones is lost in both *perilunate* and *lunate* dislocations. Sometimes a *triangular appearing lunate* will be found in a *lunate dislocation*.

On the lateral x-ray, there should be normal '*stacking of cups*' (fig 5). The radius, capitate, and base of metacarpals are all look like cups and should stack on top of each other in a straight line. Assess the radio-lunate-capitate line, a vertical line through the radius, which should normally bisect the capitate. If there is not normal stacking, consider a perilunate dislocation. With further displacement of the lunate out of the seat of the capitate, the lunate appears like a '*spilled tea cup*' and then is classified as a complete *lunate dislocation*.



Fig 5: Normal 'stacking of cups'



Fig 6: Spilled tea-cup sign of a lunate dislocation

Q: What are consequences of missing a perilunate dislocation?

There can be long-term functional disability and pain. There is a high risk of median nerve palsy, pressure necrosis, compartment syndrome and long-term wrist dysfunction.

Clinical Pearl: a FOOSH injury + acute carpal tunnel syndrome = perilunate dislocation until proven otherwise

Q: How do you perform a perilunate dislocation reduction in the ED?

Reduction of a perilunate dislocation is a simple procedure that can and should be done by the ED physician in the ED. The elbow is flexed to 90 degrees and hand placed in finger traps. 10-15lbs of longitudinal traction is applied for 10 min. With a dorsal dislocation, the wrist is initially extended and traction is applied. The wrist is then flexed with volar pressure applied to the lunate. A palpable clunk may be perceived.

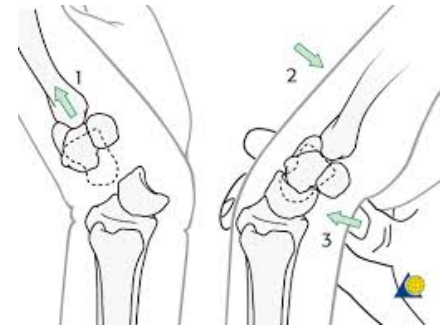


Fig 7: Closed reduction of perilunate dislocation Post-reduction, these patients should be placed in a volar slab, in **neutral** position to avoid median nerve damage.

If adequate anatomical reduction is achieved, these patients require close orthopedics follow up in 1-2 days for possible operative management.

Key References

1. Anderson, RB, Hunt, KJ, & McCormick, JJ. Management of common sports-related injuries about the foot and ankle. 2010. J Am Acad Orthop Surg, 18(9): 546-56. Abstract available at: <http://www.ncbi.nlm.nih.gov/pubmed/20810936>
2. Caswell, F & Brown C. Identifying foot fractures and dislocations. 2014. Emerg Nurse, 22(6): 30-4. Abstract available at: <http://www.ncbi.nlm.nih.gov/pubmed/25270819>
3. Stanbury, SJ & Elfar, JC. Perilunate dislocation and perilunate fracture-dislocation. 2011. J Am Acad Orthop Surg, 19(9): 554-562. Abstract available at: <http://www.jaaos.org/content/19/9/554.abstract>
4. Boyd, KT, Peirce, NS, & Batt, ME. Common hip injuries in sport. 1997. Sports Med, 24(4): 273-88. Abstract available at: <http://www.ncbi.nlm.nih.gov/pubmed/9339495>
5. Moeller, JL. Pelvic and hip apophyseal avulsion injuries in young athletes. 2003. Curr Sports Med Rep, 2(2): 110-5. Abstract available at: <http://www.ncbi.nlm.nih.gov/pubmed/12831668>