Wrist Injuries

It doesn’t have to be a black box.
Anatomy

The Key to the Black Box
Palmer Wrist Ligaments
Dorsal Wrist Ligaments
Intrinsic Wrist Ligaments

Intrinsic Scapholunate Complex
Scapholunate interosseous ligament
a. Dorsal component
b. Proximal component
c. Palmar component

Radioscapholunate ligament

MidCJ

Lunate

Dorsal radiocarpal joint capsule

RCJ

Radius
Ring Theory
Disclaimer

• “The reader is reminded that the classification scheme presented here has evolved from a synthesis of experimental studies, case reports, and personal experience. It does not necessarily represent the thought processes of each of our contributors.” David M Lichtman
Intercalary Segment
Carpal Alignment
Carpal Alignment
Radiographic Appearance
Radiographic Appearance
"Ha! WE got him now!"
PA View
Lateral View
Other Radiographic Studies

- MRI Arthrogram
- CT Scan
- Bone Scan
The Lingo

- Static vs Dynamic vs Pre-dynamic
- Dissociative (inter-carpal) vs Non-dissociative (mid-carpal)
- DISI (dorsal intercalary segment instability) vs VISI (volar intercalary segment instability)
Clenched Fist View for Dynamic Instability
CID vs CIND
DISI vs VISI
I. Perilunate instabilities (CID)
   A. Lesser arc pattern
      1. Scapholunate instability
         a. Dynamic—partial
         b. Static—complete (DISI)
         c. Rheumatoid/inflammatory
      2. Triquetrolunate instability
         a. Dynamic—partial
         b. Static—complete (VISI)
         c. Rheumatoid/inflammatory
      3. Complete perilunate dislocation
         a. Dorsal perilunate dislocation
         b. Palmar lunate dislocation
   B. Greater arc pattern
      1. Scaphoid fracture
         a. Stable
         b. Unstable (DISI)
      2. Naviculocapitate syndrome
      3. Trans-scaphoid transtriquetral perilunate dislocations
      4. Variations and combinations of 1 through 3

II. Midcarpal instabilities (midcarpal CIND)
   A. Intrinsic (ligamentous laxity)
      1. Palmar midcarpal instability (VISI)
      2. Dorsal midcarpal instability (DISI)
      3. Combined
   B. Extrinsic (dorsally displaced radial fracture)

III. Proximal carpal instabilities (proximal carpal CIND?)
   A. Ulnar translocation of the carpus
      1. Rheumatoid
      2. Posttraumatic
      3. Iatrogenic (after excision of the ulnar head)
   B. Dorsal instability (after dorsal rim distal radial fracture—dorsal
      Barton's fracture)
   C. Palmar instability (after volar rim distal radial fracture—volar
      Barton's fracture)

IV. Miscellaneous
   A. Axial
   B. Periscaphoid
Gout
Differentiation of Gout

- Clinically may be very hard to tell, history often the primary clue
- Usually afebrile
- Usually normal CBC
- Aspiration of joint only definitive test
Carpal Instabilities
Perilunate Dislocation
Mechanism of Injury
Mayfield Classification
Repair
Scapho-Lunate Ligament Injuries

DISI (Dorsal Intercalary Segment Instability)
Extrinsic Scapholunate Complex

1. Radioscapoholunate ligament
   a. Radial collateral component
   b. Radioscaphoid component
   c. Radiocapitate component

2. Long radiolunate ligament

3. Radioscapholunate ligament

4. Short radiolunate ligament

Scaphotrapezial ligament
Scaphocapitate ligament
Scapholunate intersosseous ligament
Palmar component
Proximal component (cut edge)
DISI Injuries

- Scapho-lunate instability and/or tenderness on clinical examination
- Dorsal rotation of lunate on lateral x ray
- Scapho-lunate widening on PA x ray or clench fist view
- Scapho-lunate dye leak on arthrogram
Treatment Options

- Pre-dynamic
- Dynamic
- Static
- Acute
- Chronic
Pre-Dynamic or Dynamic

• Leave alone - remember not all SL injuries will progress
• Repair or pin
• Capsulodesis
• Ligamentodesis
• Limited Fusion
Static

- Repair or pin
- Capsulodeis
- Ligamentodesis
- Limited fusion
- Ligamentous reconstruction
DORSAL FLAP FROM LIGAMENT

NOTCH FOR LIGAMENT INSERTION

SCAPHOID ROTATED
LIGAMENT INSERTED TO DEROTATE SCAPHOID

PULL OUT WIRE
Post Operative Care

• Cast or splint for 8 weeks - most papers indicate 12 weeks, but maintain finger ROM
• Remove Pins and begin ROM
• If progressing to fast consider re-immobilizing, do NOT go past 40 degrees
• If still limited in flexion at 3 months consider dynamic splinting
Late Static or SLAC

- Do nothing
- Soft Tissue Procedures Will NOT Last
- Mid Carpal Fusion - Tri-scaphi Fusion (if Radio-Scaphoid Joint Intact), Four Corner Fusion +/- Excision Scaphoid +/- Styloidectomy
- Wrist Fusion
Luno-triquetral Ligament Injuries

VISI (Volar Intercalary Segment Instability)
Isolated Membranous Injury
Isolated Membranous Injuries
VISI Injuries

- Instability and/or tenderness of luno-triquetral ligament
- Volar rotation of lunate on lateral x ray
- Luno-triquetral widening on PA x ray
- Luno-triquetral dye leak on arthrogram
Treatment Options

• Capsular repair or tightening
• Luno-triquetral fusion (will not do in a smoker)
Post-Operative Care

• Immobilize for 6 weeks
• Begin mobilization and gentle strengthening
• Consider static progressive or dynamic static progressive splint at 3 months
Carpal Instability Non-Dissociative
CIND
CIND Due to Radial Malunion
CIND Due to Radial Malunion
CIND Due to Radial Malunion
TFCC Meniscus Injuries
Post-Operative Care

• Short arm splint for 6 weeks
• Begin ROM at 2 weeks
Ulnar Detachment
TFCC Repair
Post Operative Care

- Long arm splint or cast neutral position for 6 weeks
- Change to short arm brace and begin ROM and strengthening
Capsular Injuries of TFCC
Triangular Fibrocartilage Complex Injuries (TFCC)

- Instability and/or tenderness at distal radial-ulnar joint
- Dorsal displacement of ulna on lateral x-ray
- Subluxation of distal radio-ulnar joint on CT scan
- Dye leak of TFCC on arthrogram
Treatment of DRUJ Instability

- Recognize early and immobilize in long arm cast or splint for 6 weeks
- If Ulnar styloid detached consider ORIF
- If late ligamentous reconstruction - generally poor results
Carpal Fractures

- Any carpal bone
- Many are hard to detect on plain x ray
- High index of suspicion for focal tenderness
Thank you
Initial Treatment of Wrist Injuries

- Immobilization
- Elevation
- Ice
- Analgesia
- Re-evaluation
Carpal Tunnel View
What Is an Emergency

• Neurovascular compromise; present or potential
• Open Fracture
• Infection
Other Views

• Scaphoid View
• Clench Fist View
• Hook of the Hamate
• Carpal Tunnel View
• Oblique View
Scaphoid View
Hook of Hamate View
Wrist Emergencies

- Dislocations: perilunate, carpometacarpal
- Open fracture of a carpal bone
- Septic Wrist
Carpal Metacarpal Dislocation
Infection
Open Fracture
Clinical Assessment of Infection

- Swelling
- Erythema
- Pain with motion
- Fever
Laboratories for Infection

- CBC
- Sedimentation Rate
- Joint Aspirate - cell count, crystals
- X ray
- MRI
Infection Foolers

- Gout
- Gout
- Gout
- Gout
- Other Rheumatoid Disorders