Hand and Wrist Pain in the Young Athlete: A Systematic Approach

Joshua A. Ratner, M.D.

“My wrist is KILLING me…”

• Frequent complaint
• Frequent reason for pediatrician, PT, AT visit
• Frequent reason for referral to specialist
• Frequently challenging to diagnose

My Goals

• Familiarize you with common hand injuries
• Review relevant anatomy
• Consider important elements of the history
• Discuss the basics of the hand exam
• Help you to formulate a differential diagnosis
• Allow you to more effectively manage these patients
“Hand Surgery is Applied Anatomy”

- Bone and Joint
- Tendons
- Joints
- Ligaments
- Nerves
- Vessels

Surface Anatomy

Anatomy: Bone and Joint
Where does it hurt?

- Dorsal
- Volar
- Over the bone
- At a joint
Wrist Pain

- Acute
  - Fracture/Dislocation
    - Distal Radius
    - Carpal (scaphoid #1)

Dorsal Radial

- Scapholunate ligament sprain

Dorsal Radial

- Tendonitis
  - Dequervain’s
  - Intersection syndrome
  - EPL, EDC
Dorsal Radial: Ganglions

Images courtesy of ASSH.org

Dorsal Ulnar

- Acute
  - Ligament: TFC, LT
  - Bone: Ulnar Styloid, DRUJ, 4th/5th CMC joints

- Chronic
  - Ulnar impaction/ TFC tear
  - ECU subluxation

J.Ratner, MD

Atlas of Human Anatomy, Netter

Applied radiology.com

Children’s Healthcare of Atlanta
**Volar Radial**

- Acute:
  - Fracture
  - Ligament injury
  - FCR tendonitis

- Chronic
  - Volar Ganglion
  - CMC synovitis

**Volar Ulnar**

- Hamate hook fracture

**“central”**

- Keinbock’s Disease
- Carpal Boss
- CMC synovitis
What not to miss…

- Scaphoid fracture
- SL ligament injury
- Hamate Hook
- Keinbock’s

My HAND HURTS!!

Metacarpal Base Fractures

- Often occur as a result of a crush injury
  - Toddlers
  - Hand vs Helmet

- May swell considerably, especially if multiple metacarpals fractured

- Tense swollen hand needs to be evaluated by experienced ER personal or hand surgeon.
Multiple Metacarpal Base Fractures

14 month old child
Hand crushed by garage door
Multiple metacarpal fractures
Tense Swelling

THIS NEEDS PROMPT EVALUATION BY HAND SURGEON

Metacarpal Base Fractures

• Always evaluate for CMC joint fracture/dislocations
• Most commonly of the fourth/fifth fingers
• Frequently unstable, may require surgical fixation
• Urgent reduction suggested but not imperative.
• Patient should be referred to hand surgeon within 48 hrs if not reduced or if closed reduction fails

Bennett’s Fracture and Pediatric Equivalents

• Usually through the physis in younger kids
• May be into the thumb CMC joint in adolescents/adults
• Emergent reduction not critical but encouraged if resources available
• Multiple reduction attempts can injury physis
Metacarpal Shaft Fractures

- Transverse, Oblique, or Spiral fractures
- Difficult to maintain reduction
- Usually need fixation if maligned
- DO NOT NEED EMERGENT REDUCTION
- Hand Surgery visit within one week is appropriate
- provided neurovascular exam and soft tissues are not in jeopardy

Metacarpal Shaft Fractures

- Splint in:
  - RADIAL GUTTER for index/middle rays
  - ULNAR GUTTER for ring/small rays

Fifth Metacarpal Neck Fx

- Usually occurs after punching something
- Beware of the “fight bite” injury
- May occur after fall onto clenched fist
**Fifth Metacarpal Neck Fx**

- X-ray parameters not as critical as clinical exam
- Acutely: Assess skin integrity, rotation, extensor lag
- Check neurovascular status (unless high energy injury, this is rarely compromised)

---

**Clinical Exam is What Counts!**

Despite flexed metacarpal neck fracture, no extensor lag or malrotation... so no reduction and no surgery

---

**MP Joint Injuries**

- Sprains
  - Grade 1
  - Grade 2
  - Grade 3
- Dislocations
  - Complex
  - Simple

---
Thumb sesamoids

Int. J. Morphol. vol.30 no.3 Temuco set. 2012

Thank you!