TOP HAND, AND WRIST PROBLEMS: HOW TO SPOT THEM IN CLINIC

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Outline

• Carpal Tunnel Syndrome
• Trigger Finger
• Basal Joint arthritis
• De Quervain tenosynovitis
• Mallet Finger
• Ganglion cyst

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Disclosures

• None
Carpal Tunnel Syndrome

- Compression of median nerve in carpal tunnel
- Irritation of the nerve presents as numbness/pain

10 structures
9 flexor tendons
Median nerve

Anatomy (motor)

- Thenar Muscle (OAF)
  - Opponens Pollicis (deep)
  - Abductor Pollicis Brevis (superficial)
  - Flexor Pollicis Brevis (superficial 1/2)

Etiology

1. Idiopathic – most common
2. Anatomic – rare
3. Systemic – DM, hypothyroidism
4. **** Occupational Exposure

**** “A direct relationship between repetitive work activity (eg, keyboarding) and CTS has never been objectively demonstrated.”**1
Rare anatomic causes

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cause</th>
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</thead>
<tbody>
<tr>
<td>Tenosynovitis</td>
<td>CMC arthritis</td>
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<tr>
<td>Ganglion</td>
<td>Fracture</td>
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<tr>
<td>Persistent Median artery</td>
<td>Acromegaly</td>
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<td>Abnormal muscle</td>
<td>Tumor</td>
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Carpal Tunnel Syndrome

- **HPI – systemic risk factors**
  - More common in:
    1. Diabetics
    2. Hypothyroidism
    3. Pregnancy (20-45%)

**HPI - local risk factors**

- "I wake up at night and my hands are asleep"
- "I have to shake them to get the blood flowing again"
- "I have to run them under warm water and then I can go back to sleep"
- "Fingers go numb when I drive"
- "My hand goes numb when I use my cell phone"
- "I am always dropping things"
- "Can't button my shirt"

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Diagnosis

- Thenar Muscles (APB)
  - Weakness
  - Atrophy

Severe thenar atrophy

Provocative Tests

- Most Common
  - Tinel's (tapping)
  - Phalen's (flexion)
  - Durkan's (compression)
  - Reverse Phalen's

Diagnosis: Tinel’s Sign
### Diagnosis: Phalen’s Test

- [Image of Phalen’s Test](image)

### Reverse Phalen’s test

- [Image of Reverse Phalen’s Test](image)

### Durkan’s Carpal Compression

- [Image of Durkan’s Carpal Compression](image)

### Carpal Tunnel Syndrome

- **Diagnosis is clinical!**
- **EMG/NCV**
  1. Confirmatory
  2. Establish a baseline
  3. Determine severity
  4. r/o cervical radiculopathy
  5. r/o peripheral neuropathy

- [Link to Carpal Tunnel Syndrome](http://morphopedics.wikidot.com/carpal-tunnel-syndrome)
Treatment

- Nonoperative
- Surgical

Stages

- Mild
  - Duration < 1 year
  - Intermittent numbness
  - Normal sensory and motor
  - EMG: mild CTS

- Moderate
  - Continuous numbness, paresthesia
  - Abnormal sensory testing
  - EMG: moderate CTS

- Severe
  - Persistent loss sensory + motor function
  - Thenar atrophy
  - EMG: severe CTS

Refer to Hand Surgeon

Nonoperative Treatment

- Initial treatment for most cases

Mainstay:
- Night splints (neutral)
- Corticosteroid injections

Adjuvant:
- NSAIDs
- Ergonomic modifications
- Occupational therapy for nerve and tendon glides
- Iontophoresis
- Ultrasound therapy

Carpal Tunnel Syndrome Injections

Indication: mild to moderate disease

Therapeutic:
- 75% of patients have symptom improvement @ 6 weeks
- 20% symptom free at 1 year

Diagnostic:
- Help isolate contribution of carpal tunnel to unclear clinical presentation

Prognostic:
- (+) response: 87% surgical success
- (-) response: 54% surgical success
Carpal Tunnel Syndrome

- Injection Technique
  - Inject ulnar to palmaris longus or in-line with ring finger
  - Start at proximal wrist crease aiming 30-45 degrees distally
  - 25 or 27 gauge needle, 1 ½ in
  - 2 cc mix (10mg kenalog: 1 cc lido)

Carpal Tunnel Syndrome

- When to refer?
  - Failure of non-operative treatment
  - Moderate to Severe CTS
  - Unclear diagnosis

Surgery

- Release transverse carpal ligament
- Under local or regional anesthesia

Mini-Open Carpal Tunnel Release

(From Columbia University dept. of neurosurgery website)

Endoscopic Carpal Tunnel Release

http://www.outpatientsurgery.net/ (http://wintman.podbean.com/)
Outline
- Carpal Tunnel Syndrome
- **Trigger Finger**
  - Basal Joint arthritis
  - De Quervain tenosynovitis
  - Mallet Finger
  - Ganglion cyst

**Trigger Finger**
- Medical Term: Stenosing tenosynovitis

  - **2 subtypes:**
    1. Nodular – localized swelling, “nodule”
       * more responsive to NSAIDS/steroid injection
       * 93% success with injection (< 6 mos)
    2. Diffuse
       * diabetics
       * 48% success with injection

**Trigger Finger**
- Variable presentation
  - Clicking +/- pain
  - Pain @ A1 pulley, no clicking
  - Sensation of clicking at PIP joint
  - Pain radiating up to the forearm
  - Worse in the morning or night

**Trigger Finger**
- Physical Examination
  - Tenderness at the level A1 pulley
  - Locking or clicking over the A1 pulley
  - +/- nodule
Primary Trigger Finger

- Most Common
- “Idiopathic”

Secondary

- Associated with known disease
- Disease cause thickening in tendon/pulley
  - Diabetes
  - Rheumatoid arthritis
  - Amyloidosis
  - Sarcoidosis

Pediatric trigger thumb

- Acquired, NOT congenital!
- Often present with fixed flexion contracture
- Recommendation:
  1. Good results with release after age 1 (> 90% success)
  2. May elect to observe b/c 60% Spontaneously resolve within 4 years

Pediatric Trigger Finger

NOT the same as adult trigger finger
Always refer to hand surgeon
Anatomic anomalies frequently found
Treatment: A1 pulley release and resection of FDS slip

Treatment Options (Adult)

- **Nonoperative**
  - Observation, activity modification
  - NSAIDs
  - Trigger finger ring/splint
  - Corticosteroid injection
- **Operative release**
  - Percutaneous
  - open

**** Studies show steroid injection alone is more effective than splints
Steroid Injection

- 70% can resolve after a single injection
- 57% (level 1 and 2 studies)
- Lower success rate
  - younger patients
  - Diffuse type
  - diabetics
  - multiple fingers
  - other upper extremity tendinopathies
- Most effective if symptoms less than 6 mos and nodular type

Injection

- Combination local anesthetic and steroid
- Around the tendon in area of A1 pulley
- **No difference in success if injected inside or outside of the sheath!**

Risks of injection

- Infection
- Fat atrophy
- Bleaching of skin
- Tendon Rupture
- Hyperglycemia in diabetics

Injection in Diabetics

- Increase blood glucose
- Greatest effect 24 hours after injection (150% baseline)
- Effect lasts up to 5 days
Surgery
- Failure of non-surgical treatment
- May be a first line treatment in diabetics
- Locked finger

Percutaneous release

Open release

Trigger Finger
- When to refer?
  - Failure of at least one injection
  - Locked trigger finger
  - Unclear diagnosis

http://www.amhandinst.com/triggerfinger.html
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Basal Joint = Thumb CMC joint

http://www.noelhenley.com/280/joints-of-the-thumb/

Anatomy

History
- Do you have difficulty:
  - pinching, writing
  - opening a tight jar
  - Opening doors, keys
  - carrying a shopping bag
  - using a knife to cut food
Clinical Exam

• Physical appearance
• Tenderness
• Specific Tests

- Grind

Van Heest, JAAOS 2008

Nonoperative management

- Custom made thermoplastic splint
- Off the shelf splint
- Activity modification education
- Symptom management

Thumb CMC OA Injection

- Injection
  - Distract the joint
  - Mark the site of injection
  - Prepare the site of injection
  - Advance needle to bone and inject small amount
  - Once anesthetized, advance needle into the joint and inject

Thumb CMC OA

- Injection into the CMC joint is often painful, especially in more advanced disease

Courtesy of Peter M. Murray, MD
Treatment: Surgical

- Later stages
- CMC arthrodesis
- Resection arthroplasty
- LRTI

Thumb CMC OA

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DeQuervain’s Tenosynovitis

- Tendonitis 1st dorsal compartment
- APL: Abductor pollicis longus
- EPB: Extensor pollicis brevis

Anatomy

Sheath enclosing APL/EPB becomes narrowed leading to pain and inflammation

Symptoms

- More common in women (6:1 ratio)
- New mothers
- Pain at the radial wrist/base of thumb
- May have ‘clunking’ of the thumb
- Pain with thumb motion

Examination

- Tenderness over tendons at thumb side of wrist
- Finkelstein’s test
  - Thumb in fist
  - Ulnarly deviate
**Treatment**

- Conservative
- Surgical

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**DeQuervain’s Tenosynovitis**

- Pre-fabricated or custom thumb spica splint
- Ice
- Activity modification
- Patient education

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**De Quervain’s Tendonitis**

- Non-operative treatment
- Success Rates:
  - NSAIDs alone: 0%
  - Splinting: 14%
  - Injection + splint: 61%
  - Injection alone: 83%!!!

- Injection
  - Up to 83% success rate, but may require 2 injections
  - Failure:
    1) Poor technique
    2) EPB subsheath

- Risk of skin hypopigmentation
- Generally limit injection to 2-3 max
- Water soluble corticosteroid = less local skin reactions

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**De Quervain’s Tendonitis**

- Injection Technique
  - 2cc 1:1 mix of 1% lidocaine and water soluble steroid
  - Inject inside sheath in line with tendons and not subQ
  - Should see the compartment fill up
Pregnancy/lactation
- Increased fluid shifts/edema secondary to hormonal fluctuation
- Tx: splinting and/or corticosteroid injection
- One study showed nearly 100% response to steroid injection, symptoms almost always resolve at the end of lactation

Surgical Treatment
- Indicated only after failure of conservative treatment
- Division of the fibro-osseous sheath over the tendons

DeQuervain’s Tendonitis
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“Jammed Finger”
Mallet Finger

Red Flag Mallet Finger
When to Refer:
1. Big fragment
2. Volar subluxation of the distal phalanx

Mallet Finger
Soft Tissue Mallet
Bony Mallet

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  • Ganglion cyst
Ganglion Cyst
- Dorsal – 70%
- Volar – 20%
- Mucous


Occult ganglion cyst

Mucous

Recurrence rates

**Dorsal Ganglion**
- Aspiration: 13% cure (single aspiration)
- 85% cure (3 repeat aspirations)
- Surgical: 4% recurrence rate

**Volar**
- Aspiration: 57 – 83%
- Aspiration not recommended (proximity to radial artery, palmar cutaneous branch of median nerve)
- Surgical: 7% – 33% recurrence rate

**Mucous cyst**
- Aspiration: > 50% recurrence rate
- Surgery: 2% recurrence rate

References

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   Fleisch, S. B. et al JAAOS March 2007;15:166-171
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