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

Nicolas H. Lee, MD
Nicolas.Lee@ucsf.edu
UCSF Dept of Orthopaedic Surgery
Assistant Clinical Professor
Hand, Upper Extremity and Microvascular Surgery
Dec. 3rd, 2017

Disclosures

Research Support:

San Francisco DPH
Standard Cyborg
DIP joint pathologies

1. Mucous Cyst
2. Mallet Finger
3. Jersey Finger

Mucous Cyst – ganglion cyst of DIP joint
Xray
Treatment

- Recurrence rate with aspiration/needling?
  40-70%

- Recurrence rate with surgical debridement of osteophyte?
  0-3%

- Do nail deformities resolve with surgery?
  Yes - 75%

“Jammed Finger”

Mallet Finger

Jersey Finger

Jersey Finger is an FDP avulsion in Flexor Zone I
Mallet Finger

Soft Tissue Mallet

Bony Mallet


Mallet finger

• 6 weeks DIP immobilization in extension
• Night time splinting for 4 weeks
Red Flag Mallet Finger

When to Refer:

1. Big fragment

2. Volar subluxation of the distal phalanx

Red Flag Jersey Finger

Flexor Digitorum Profundus (FDP) strength testing

http://nervesurgery.wustl.edu/

http://www.orthobullets.com

REFER ALL JERSEY FINGERS ASAP!!!
Trigger Finger and Thumb

- Presentation
  - Clicking or frank locking
  - Especially at night or morning
  - May also present with just pain at the A1 pulley
Trigger Finger

• Physical Examination
  • Locking or clicking over the A1 pulley
  • Tenderness at the A1 pulley

Primary Trigger Finger

• Most Common
• “Idiopathic”
• No known cause
Secondary

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

“Congenital”

- Infantile form
- “congenital” is a misnomer
Treatment Options

• Nonoperative
  • Observation
  • Non-steroidal anti-inflammatory medication
• Splinting
• Corticosteroid injection
• Operative release

Studies show steroid injection alone is more effective than splints

Trigger finger Splinting

• Splint to prevent MCP or PIP flexion.
• Patient education
• Symptom management
• Ice
Steroid Injection

- 60-70% can resolve after a single injection
- Most effective if symptoms less than 6 mos

- Lower success rate
  - younger patients
  - diabetics
  - multiple fingers
  - other upper extremity tendinopathies

Injection

- Combination local anesthetic and steroid

- At level of A1 pulley

- No difference in success if injected inside or outside of the sheath
Injection in Diabetics

- Increase blood glucose
- Greatest effect 24 hours after injection
- Effect lasts up to 5 days

Surgery Indications

- Failure of non-surgical treatment
- Patients with locked finger
- May be a first line treatment in diabetics
Surgery - A1 Pulley Release

• Protect the digital artery and nerve
• Release A1 pulley

Infantile Trigger Thumb

• Nonoperative (age less than 2)
  - Indications: age < 2, flexible deformity
  - 30-60% spontaneous resolution if age < 2
  - <10% spontaneous resolution if age > 2

  1. Passive thumb extension exercises
  2. Intermittent extension splinting

• Operative (A1 pulley release)
  - Indications: age > 2, fixed deformity beyond age 1
Thumb CMC arthritis

History

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

**Splints**
- Custom made thermoplastic splint
- Off the shelf splint

**CMC Protection program**
- Adaptive equipment
- Activity modification education
- Symptom management
Thumb CMC OA

- Injection
  - Distract the joint
  - Mark the site of injection
  - Prepare the site of injection
  - Max: 1 cc
    Joint distension = pain

Treatment: Surgical

Fusion (Young laborer)  Trapeziectomy +/− something else  CMC Arthroplasty
DeQuervain’s Tenosynovitis

- Tendinosis of tendons of the first dorsal compartment
- Abductor pollicis longus (APL) and extensor pollicis brevis (EPB)
- Sheath enclosing the tendons becomes narrowed leading to pain and inflammation
Anatomy

Symptoms

• Pain on thumb (radial) side of wrist
• Worse with lifting/ repetitive activity
• Mothers of very young children
• Worse at night
• Worse with thumb motion
**Symptoms**

- More common in women (6:1 ratio)

- Often occurs in new mothers and in later stages of pregnancy as an overuse of the thumb

- Pain at the thumb base or radial wrist

- Patients will sometimes complain of ‘clunking’ of the thumb

**Examination**

- Tenderness over tendons at thumb side of wrist

- Finkelstein’s test
  - Place thumb in fist; move fist ulnarly, sharp pain over the radial wrist
Treatment

- Nonoperative
- Surgical

Dequervain’s tenosynovitis

- Pre-fabricated or custom made splint
- Ice
- Activity modification
- Patient education
DeQuervain’s Tendonitis

• Non-operative treatment
  • Injection
    • Up to 80% success rate, but may require 2 injections
    • Risk of skin de-pigmentation

• Combination of splint and injection not more effective than injection alone

• Generally limit injection to 2-3 max

DeQuervain’s Tendonitis

• Injection
  • 1 cc 1:1 mix of lidocaine 1% and water soluble steroid (less risk of skin depigmentation)
  • Inject inside sheath and not subQ
  • Should see the compartment fill up

www.assh.org
http://www.aafp.org/afp/20030215/745.html
Pregnancy/lactation

- Thought due to the increased fluid shifts/edema secondary to hormonal fluctuation
- Generally responds to 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
Ganglion Cyst

Wrist Ganglion Cyst

Dorsal – 70%

Volar – 20%
Occult ganglion cyst

Recurrence rates

**Dorsal Ganglion**
- **Aspiration**: 87% recurrence (single aspiration)
- 50-70% recurrence (repeat aspirations)
- **Surgical**: 4% recurrence rate

**Volar**
- **Aspiration**: 85-100% recurrence
  - Aspiration not recommended (proximity to radial artery, palmar cutaneous branch of median nerve)
- **Surgical**: 7% – 33% recurrence rate
Carpal Tunnel Syndrome

Symptoms

Numbness into any combination of the thumb, index, middle, and half of ring finger
Anatomy (motor)

- Thenar Muscle
  - Opponens Pollicis
  - Abductor Pollicis Brevis
  - Flexor Pollicis Brevis (Superficial 1/2)

Symptoms

- Worse at night, with wrist bent (phone, driving, sleeping)
- Pain/burning in the wrist, fingers, arm
- Late stage-
  - weakness
  - “clumsy”
  - “can’t button my shirt”
  - “drop objects”
Diagnosis: Tinel’s Sign

Diagnosis: Phalen’s Test
Durkans (Carpal compression test)

Diagnosis

- Thenar Muscles (APB)
  - Weakness
  - Atrophy
Diagnosis is founded on:

- A clear history of specific symptoms.
- Clinically apparent signs.
- Clinically measurable sensory and motor deficits.
- Reproducible provocative diagnostic tests
- And, if needed, electrodiagnostic tests.

### Stages

- **Mild**
  - Duration < 1 year
  - Intermittent numbness
  - Normal sensory testing
  - No weakness or atrophy
  - Minimal NCV changes, no denervation
- **Moderate**
  - Continuous numbness, paresthesias
  - Increased threshold on sensory tests
  - Increased distal motor latency
- **Severe**
  - Persistent loss sensory+ motor function
  - Thenar atrophy
Treatment

- Nonoperative
- Surgical

Nonsurgical Treatment

- Initial treatment for most cases
- Splint
  - night
- Occupational therapy – nerve glides
- Corticosteroid injection
Carpal Tunnel Syndrome: Therapy

- Patient education
- Night time wrist brace
- Nerve glides
- Activity modification

Carpal Tunnel Syndrome

- Injections
  - **Therapeutic**
    - 80% of patients have symptom improvement @ 6 weeks
    - Of those, only 20% are symptom free at 12 months
  - **Diagnostic**
    - Help isolate contribution of carpal tunnel to current presentation
  - **Prognostic**
    - 93% of those that improve with injection also improve with surgery
Carpal Tunnel Syndrome

- **Injection**
  - 1 ½ inch 27 g needle
  - 1 cc of 1:1 mix lidocaine: steroid
  - Inject ulnar to palmaris longus or in-line with ring finger
  - Start at proximal wrist crease aiming 30-45 degrees distally

- **Surgery**
  - Release transverse carpal ligament
Surgical Treatment

Elbow Pathologies

- Cubital Tunnel
- Lateral Epicondylitis
- Medial Epicondylitis
Cubital Tunnel

- Ulnar nerve compression about the elbow
- Clinical
  - numbness and tingling small and ring fingers
  - weakness of flexor digitorum profundis to small and ring finger
  - Froments sign
  - Wartenburg’s sign

Adductor Pollicis and 1st dorsal interossei atrophy
Physical Exam: Intrinsics

Signs

- Wartenberg's sign
  - ulnar deviation of the small finger and weakness of adduction of the small finger
Signs

- Froment's sign
  - Compensatory IP joint flexion for key pinch (weak Addpol, weak MP flexion of thumb)

![Normal Key Pinch](image1)
![Abnormal Key Pinch](image2)

Nonoperative Management

- Night towel splints to prevent full elbow flexion
- Activity modification
- Nerve glides
- Patient education
Operative Management

• In-situ decompression
• Subcutaneous Transposition
• Intramuscular Transposition
• Medial epicondylectomy

Lateral Epicondylitis

• One of the most common overuse syndromes encountered in the upper extremity
  • Known as tennis elbow after being described by Morris in 1882 to be caused by lawn tennis
  • Tendinosis of the components of the extensor origin
Epidemiology

- 1-3% of population will experience in their lifetime
  - Equal male/female incidence
  - Usual onset between age 35-50
- 5-10% can be attributed to playing tennis
  - Risk increases 2-3.5x playing > 2 hr/week
  - Age > 40
  - Associated with hard surface, poor stroke mechanics, improper grip and racquet weight

Risk Factors

- Manual labor with heavy tools
- Repetitive activities
- Dominant arm
- Poor coping mechanism
- Depression
Clinical Presentation

- Pain over the lateral aspect of the elbow
  - Localized at or just distal to epicondyle
  - Sharp/burning in nature
  - Radiation along course of wrist extensors
  - Worsened by resisted wrist extension with elbow extended
  - Worsened by resisted middle finger extension with elbow extended
  - Weakness of grip
  - Difficulty grasping or lifting items

Lateral Epicondylitis

Clinical Presentation

- Night pain present in severe cases
- Stiffness upon wakening may be described by patient
- Pain with even light daily activities
  - Shaving
  - Picking up coffee cup

Lateral Epicondylitis
Pathoanatomy

- Lateral epicondylitis begins as a microtear
  - Inadequate healing response
  - Always involves the **ECRB**
    - Deep and more superior fibers
- Histologically proven tendinosis (Nirschl)
  - Disordered collagen
  - Mucoid degeneration
  - Angiofibroplastic hyperplasia
  - No inflammatory component

Lateral Epicondylitis

Physical Exam

- Assess for warmth or erythema
- Point tenderness just distal and anterior to lateral epicondyle

Lateral Epicondylitis
Physical Exam

• Pain with resisted wrist extension
• Long finger extension test
• Pain with passive wrist and digital flexion

Lateral Epicondylitis

Physical Exam

• Assessment of grip strength
  • Compare to unaffected side
  • Baseline objective measure of severity of lateral epicondylitis
• Can be tested serially to assess response to treatment
Treatment

- Activity modification
  - Limit lifting and repetitive grasping
  - Lifting with elbow flexed or forearm supinated need not be restricted
  - No vibrational tools
- Equipment modification
  - Restring racquet
  - Change grip size
  - No gloves (they increase gripping force)

Lateral Epicondylitis/Tennis elbow

- Wrist brace to immobilize the wrist extensors
- Passive stretches (Mill’s)
- Ice
- Soft tissue massage
- Patient education
- Activity modification
Treatment

- **Nirschl Exercises**
  - Focuses on increasing strength, flexibility and endurance
  - Stretch wrist extensors w/ elbow extended
  - Progress to isometric and concentric strengthening
  - Resume activities with increasing duration

Treatment

- **Physical Therapy**
  - Cross friction massage
  - Eccentric strengthening
  - Ultrasound
  - Iontophoresis
  - NSAIDS (Oral and topical)
Treatment

- Counterforce brace
  - Theoretically limit muscle expansion
  - Create a new more distal muscle origin
  - Less tensile stresses seen by injured tendon
- Wrist cock-up splint
  - Diminishes contraction of the wrist extensors

Other Treatments

- Corticosteroid injection
- Platelet-rich Plasma
- Surgery
Do corticosteroid injections help?

Conclusions
This meta-analysis showed that there is no difference in pain intensity between corticosteroid injection and placebo 6 months after injection. We interpret the weight of evidence to date as suggesting that corticosteroid injections are neither meaningfully palliative nor disease modifying when used to treat eECRB. (J Hand Surg Am. 2016;41(10):988-998. Copyright 2016 by the American Society for Surgery of the Hand. All rights reserved.)

- Open Tendon Debridement
- Lateral incision over and just distal to epicondyle
- Incision of fascia in line with fibers
- Identification of the pathologic fibers of the ECRB (+ EDC)
- Resection of the diseased tissue
Medial Epicondylitis

- An overuse syndrome
  - Most common cause of medial elbow pain
  - Also known as “golfer’s elbow”
- Originally described by Morris in 1882
- Tendinosis of the flexor pronator origin

Epidemiology

- Prevalence of 0.3% in population studies (Shiri et al, Am J Epidemiology 2006)
  - 5-7x less common than lateral epicondylitis
- Slight male predilection (1.5-2:1)
- Peak incidence: 3rd - 5th decade of life
Risk Factors

- Sports (implicated in 10-20% of cases)
  - Golf, pitching, rowing, javelin, Tennis (serve)
- Occupational
  - Forceful activities
  - Repetitive Motion
- Other
  - Smoking
  - Obesity
  - Low social support

Anatomy: Medial Epicondyle

- Origin of flexors and pronator
  - Pronator teres (PT)
  - Flexor carpi radialis (FCR)
  - Palmaris longus (PL)
  - Flexor digitorum superficialis (FDS)
  - Flexor carpi ulnaris (humeral head, FCU)
Physical Exam

- Assess for warmth, erythema, swelling
- Point tenderness at or just distal and anterior to palpable medial epicondyle
- ROM
- Ulnar nerve

Physical Exam

- Pain increased with
  - Resisted wrist flexion
  - Resisted pronation
Treatment

- Similar to Lateral epicondylitis
  - PT, stretching, braces
  - Beware the ulnar nerve with injection
  - Surgery done less often

Medial Epicondylitis/Golfer’s elbow

- Wrist brace to immobilise the wrist flexors
- Patient education
- Ice
- Soft tissue massage
- Activity modification
Questions?

References

1. Carpal Tunnel Syndrome
2. Trigger Digits: Diagnosis and Treatment
3. Corticosteroid Injections in the Treatment of Trigger Finger: A Level 1 and II Systematic Review
   Fleisch, S. B. et al JAAOS March 2007;15:166-171
4. De Quervain Tenosynovitis of the Wrist
5. Management of Lateral Epicondylitis: Current Concepts
   Calfee, R. et al JAAOS Jan 2008;16: 19-29
Basics of Injections

Introduction

• Injections are generally performed using a mixture of lidocaine and a corticosteroid
  • Water soluble corticosteroids (Celestone - NaP)
    • Shorter acting
  • Water insoluble corticosteroids (Depo-Medrol, Kenalog, steroids with “acetate”)
    • Longer acting
Corticosteroid effect

- Maximum effect not until 2 weeks after injection
- Do not give up until it has been 6 weeks

Corticosteroid Risks

- Hyperglycemia
  - Affects diabetic patients for approx. 5 days
  - First 2 days up to 150% increase
  - By 5th day only 10-20% increase

- Skin de-pigmentation
  - Especially with repeat injections close to the skin
    (DeQuervain’s and Tennis elbow)

- Indentation from fat atrophy
Skin De-pigmentation

Equipment

- **Injections**
  - 1-2 cc of 1:1 mixture of lidocaine (1%) and Kenalog (10 mg/cc)
  - 25 or 27 g needle

- **Aspirations**
  - Ethyl Chloride spray

  - **18 g** needle with syringe