Evaluation and Treatment of Common Upper Extremity Problems & Injuries
Joshua Tuck, D.O., M.S.
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Objectives

• Anatomic review of the elbow, wrist and hand.
• Discuss common clinical conditions in each anatomic region.
  – Lateral and medial epicondylitis, de Quervain tenosynovitis, carpal tunnel syndrome and trigger finger.
• Describe and demonstrate evaluation techniques.
• Review osteopathic considerations in each region.
Osteopathic Principles

Overview of Epicondylitis

• Pain at the myotendinous junction of these muscle groups is referred to as lateral and medial epicondylitis, respectively.

• Lateral epicondylitis is often called tennis elbow and medial epicondylitis, golfer's elbow
Lateral Epicondylitis

- **Introduction**
  - Attributed to degeneration of the extensor carpi radialis brevis origin, although the underlying collateral ligamentous complex and joint capsule also have been implicated
  - Overexertion of the extremity with repetitive wrist extension and alternating forearm pronation/supination
- **Epidemiology**
  - 1% to 3% of adults each year
  - Diagnosis was first made by Runge in 1873
  - Named “lawn-tennis arm” by Major in 1883 due to its association with the sport
  - Adult in the fourth or fifth decade of life
  - Affects men and women equally
  - Symptoms more common in dominate arm
Epicondylitis

- The lateral epicondyle of the elbow is the bony origin for wrist extensors
- The medial epicondyle is the bony origin for wrist flexors.
Lateral Epicondylitis

• Patient History
  – Pain over the lateral aspect of the elbow is the most consistent symptoms
  – Pain is usually sharp and is exacerbated by activities involving active wrist extension or passive wrist flexion with the elbow extended
  – Characteristic complaint is the inability to hold items (ie: a coffee cup) due to pain in the lateral elbow
  – Symptom onset is frequently insidious, with no clear inciting event

Lateral Epicondylitis

• Physical Exam
  – Maximal tenderness slightly anterior and distal to the lateral epicondyle over the origin of the ECRB and the EDC muscles
  – Less frequently localized tenderness is present at the apex of the bony lateral epicondyle
  – Rarely, tenderness is accompanied by swelling, erythema, or warmth
  – Pain localized to the lateral epicondyle or just slightly distal to the extensor origin is often elicited with resisted wrist and digit extension
Special Tests for Elbow
Lateral Epicondylitis

- Forearm pronated and flat on table
- Fist with extended wrist
- Patient to resist flexion
- Pain at the Lateral Epicondyle means pathology.
- “Tennis Elbow”

Lateral Epicondylitis

- Imaging
  - Radiographs
    - Occasionally reveals calcification within the extensor mass
  - MRI
  - Ultrasound
Lateral Epicondylitis

• Differential Diagnosis

  – Radial Tunnel Syndrome
  – Cervical Radiculopathy
  – OCD lesion of radiocapitellar joint
  – Posterolateral elbow plica
  – Posterolateral elbow instability

Lateral Epicondylitis

• Nonsurgical Treatment (first line)

  – Rest
  – NSAID’s
  – Physical Therapy
  – Injection
  – Orthoses
  – Shock Wave Therapy
  – Acupuncture
  – PRP
  – Prolotherapy
Lateral Epicondylitis

• Surgical Treatment

  – May be considered when 6 to 12 months of conservative treatment has failed
  – Open Debridement
  – Endoscopic ECRB release
  – Percutaneous ECRB release

de Quervain Tenosynovitis

• Introduction

  – Stenosing tenosynovitis of the first dorsal compartment of the wrist
  – Etiology is thought to be secondary to repetitive or sustained tension on the tendons of the first dorsal compartment
  – Tension produces a fibroblastic response, resulting in thickening and swelling of the compartment and discomfort with use of the hand and wrist
  – First described in 1895 by Fritz de Quervain
de Quervain Tenosynovitis

• The first dorsal compartment of the wrist (I)
• Abductor pollicis longus and extensor pollicis brevis.
• Inflammation caused by repetitive motions or kinetic somatic dysfunctions.
• + Finklestein’s test

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de Quervain Tenosynovitis

• Epidemiology
  – No long-term epidemiologic study has been done
  – Case series suggest that it affects women up to six times more often than men and is associated with the dominant hand during middle age
  – Occupations requiring repetitive typing, lifting, and manipulation have been considered risk factors
  – Pregnant and lactating women represent an increasing cohort of patients with new-onset, self-limited disease
Overview and Incidence

- Imbalance between flexors and extensors
- de Quervain tenosynovitis is the most common entrapment tendonitis of hand and wrist after trigger finger
- It is most commonly seen in women between 30 and 50 years of age

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de Quervain Tenosynovitis

- Patient History
  - Often presents with a gradual onset of pain that may be exacerbated by grasping, thumb abduction, and ulnar deviation of the wrist
de Quervain Tenosynovitis

• Physical Exam
  – Location of tenderness is more specific to the first extensor compartment over the radial styloid
  – Possible radiation of pain to the forearm and distally to the thumb
  – The Finkelstein Test
    • Classic maneuver for diagnosis
    • Considered pathognomonic
    • Performed by grasping the patient’s thumb and quickly deviating the hand and wrist ulnarily
    • Positive test reproduces the pain

Finklestein’s test
First Dorsal Compartment

• de Quervain Tenosynovitis

  • Imaging
    – Diagnosed clinically
    – Wrist radiographs can be used to rule out other causes if diagnosis is unclear
    – MRI
de Quervain Tenosynovitis

- Differential Diagnosis
  - Intersection syndrome
  - Radial styloid fracture
  - Scaphoid fracture
  - Thumb instability
  - Basilar arthritis of the thumb
  - Radial neuritis

Nonsurgical Treatment Options

- Thumb/wrist immobilization using splint or brace
- Ice
- NSAIDs
- Improve arthrokinetics/postural modifications
- Steroid injections
DeQuervain Tenosynovitis

- Surgical Treatment

  - Release of the fibro-osseous roof of the first dorsal compartment
Surgical Management*

- Incision
- Radial Sensory Nerve
- Extensor Retinaculum
Carpal Tunnel Syndrome

• Introduction

  – First described in 1854 by Sir James Paget in patients with distal radius fracture
  – Most common compressive neuropathy of the upper extremity
  – Caused by Median nerve compression in the carpal tunnel
  – May be Acute or Idiopathic
Carpal Tunnel Syndrome

- **Epidemiology**
  - Between 0.99 and 3.46 cases per 100,000 in the United States
  - 500,000 surgical procedures annually
  - Economic impact estimated at $2 Billion annually
  - Women more than Men
  - Increasing incidence with age

- **Common compressive neuropathy.**
- Anatomic carpal tunnel is created by the transverse carpal ligament and houses the following structures:
  - Median nerve
  - Flexor digitorum profundus and superficialis.
  - Palmaris longus
Carpal Tunnel Syndrome

• Patient History
  – Pain
  – Nocturnal Pain
  – Trauma and/or repetitive movements
  – Pain may radiate to forearm or elbow
  – Weakness
  – Paresthesias in thumb and 1 or more of the radial digits
  – Decreased dexterity
  – Commonly bilateral

Carpal Tunnel Syndrome*

• Physical Exam
  – Neck to fingers
  – Skin and muscle atrophy
  – Tinel
  – Phalen
  – Durkan
Tests for Carpal Tunnel*

Phalen’s test

Prayer test / Reverse Phalen’s

Tinel’s test

Durkan’s Test

Spurling sign
Carpal Tunnel Syndrome

• Diagnostic Studies
  – EMG
  – Wrist Radiographs

Carpal Tunnel Syndrome

• Associated with many systemic conditions
  – Obesity
  – Drug Toxicity
  – Alcoholism
  – Diabetes
  – Hypothyroidism
  – Rheumatoid Arthritis
  – Renal Failure
  – Pregnancy (20% to 45%)
Carpal Tunnel Syndrome

- Differential Diagnosis
  - Overuse syndromes
  - Cervical root impingement
  - Thoracic outlet syndrome
  - Proximal median n. compression
  - CMC arthritis

Upper Limb Cutaneous Innervation
Upper Quarter Dermatomes

Carpal Tunnel Syndrome

• Nonsurgical Treatment
  – Splinting (night splints)
  – Oral Medications
    • NSAIDs
    • Oral Corticosteroids
  – Corticosteroid Injections
Goal of CTS Manual Medicine

- Lengthening or loosening the transverse carpal ligament.
- Increasing carpal tunnel diameter.
- Improving lymphatic flow.
- Restoring function and mobility to the radiocarpal and ulnocarpal joints.
- Restoring balance between the wrist flexors and extensors.

Carpal Tunnel Syndrome

- Surgical Treatment
  - Open Release
  - Endoscopic Release
Trigger Finger

- Introduction
  - Stenosing tenosynovitis
  - Is a pathological disproportion between the volume of the retinacular sheath and its contents as it moves through the A1 pulley
  - Inability to flex or extend digit smoothly
  - All digits can be affected
  - Ring finger is most common
Trigger Finger

• Epidemiology
  – More common in women
  – Average Age is 52 to 62 years old
  – Associated with
    • Rheumatoid Arthritis
    • Gout
    • Diabetes
    • Amylodosis
    • CHF
    • CTS

• Patient History
  – May report a mild, non painful click to inability to fully flex digit.
Cochrane Review

- No articles that directly compared steroid injection with surgical treatment.
- However, two referenced articles, which were excluded from the review, reported cure rates of 89 to 97 percent for surgery and 60 to 90 percent for steroid injection.
- A separate article compared splinting with steroid injection and found cure rates of 70 and 82 percent, respectively.

Trigger Finger

- Physical Exam
  - Pain at palmar base of involved digit
  - Possible nodule near A1
  - Palpable clicking
  - Locked digit flexion that must be reduced
Trigger Finger

- Imaging
  - Generally not indicated

Trigger Finger

- Differential Diagnosis
  - Carpal Tunnel Syndrome
  - Dupuytren Contracture
  - Rheumatoid Arthritis
Trigger Finger

• Nonsurgical Treatment
  – Activity modification
  – NSAIDs
  – Splints
  – Corticosteroid Injections

Trigger Finger

• Surgical Treatment
  – A1 pulley release
    • Open
    • Percutaneous
References:


Pre-test Questions:

• 1. Which location of the elbow is most prone to epicondylitis?
  • A. Lateral
  • B. Medial
  • C. Posterior
  • D. Radial head
2. All of the following are part of the differential diagnosis for “golfer’s elbow” except:

A. Flexor-pronator strain
B. Medial (ulnar) collateral ligament sprain
C. Ulnar neuritis
D. Radial head somatic dysfunction

A golfer has been struggling with elbow pain for 5 years and presents to your office because the pain is now limiting his ability to golf. Which is most likely?

A. Medial collateral ligament rupture
B. Lateral epicondylosis
C. Medial epicondylitis
D. Radial head somatic dysfunction