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.
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

• 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

• 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
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

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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
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

• 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 ulnarly
    • Positive test reproduces the pain
Finklestein’s test

First Dorsal Compartment

EPL  
EPB  
APL
de Quervain Tenosynovitis

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

• 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
Surgical Management

Radial Sensory Nerve

Extensor Retinaculum

Surgical Management

EPB

APL
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

• 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
Carpal Tunnel Syndrome

- 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.
  - Flexor pollicis 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
e
- Tinel’s test
Carpal Tunnel Syndrome

- Diagnostic Studies
  - EMG / NCS
  - Wrist Radiographs (carpal tunnel view)
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
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
    • Amyloidosis
    • CHF
    • CTS
Trigger Finger

• 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.
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

• 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: