

Evaluation and Treatment of Common Upper Extremity Problems & Injuries



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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



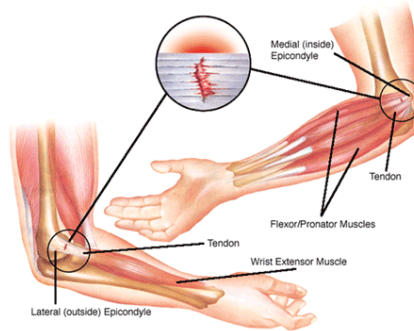
- Pain at the myotendinous junction of these muscle groups is referred to as lateral and medial epicondylitis, respectively.
- Lateral epicondylitis is often called tennis elbow and medial epicondylitis, golfer's elbow

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 dominant 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

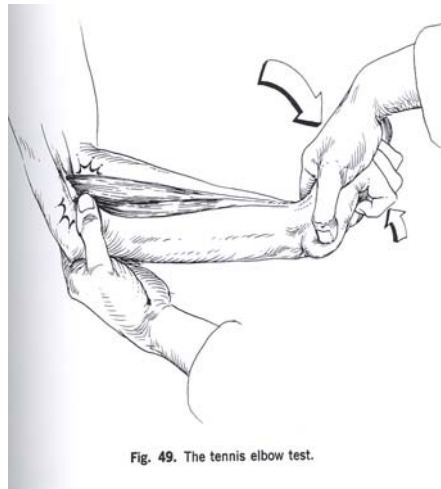
- Patient History
 - Pain over the lateral aspect of the elbow is the most consistent symptoms
 - Pain is usually sharp and is exacerbated by activities involving active wrist extension or passive wrist flexion with the elbow extended
 - Characteristic complaint is the inability to hold items (ie: a 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

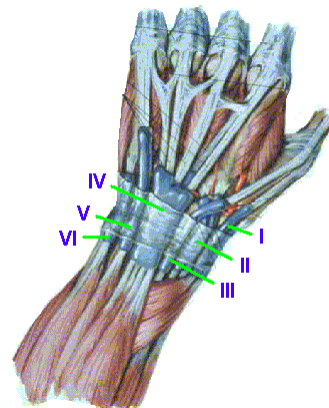
- Surgical Treatment
 - May be considered when 6 to 12 months of conservative treatment has failed
 - Open Debridement
 - Endoscopic ECRB release
 - Percutaneous ECRB release

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

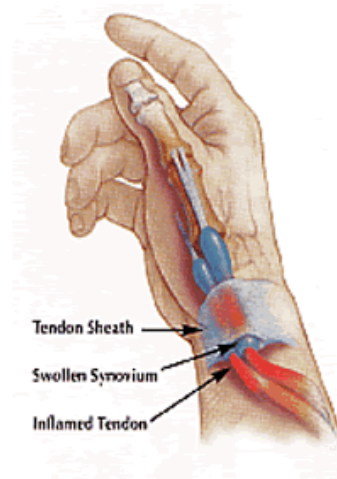


de Quervain Tenosynovitis

- 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



de Quervain Tenosynovitis

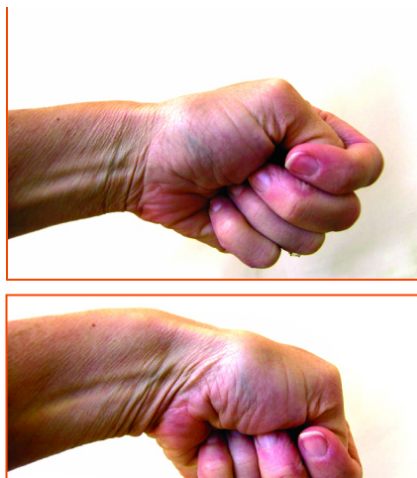
- Patient History
 - Often presents with a gradual onset of pain that may be exacerbated by grasping, thumb abduction, and ulnar deviation of the wrist



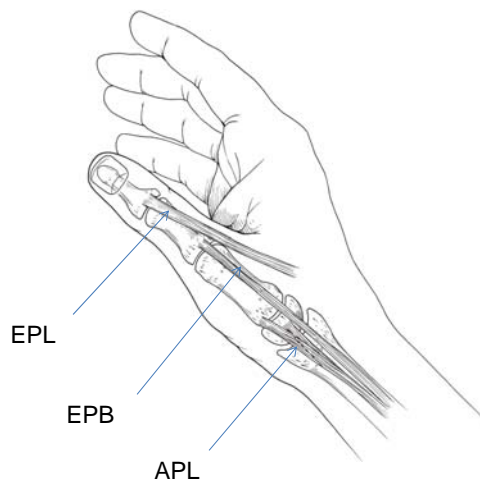
de Quervain Tenosynovitis

- 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 ulnarly
 - Positive test reproduces the pain

Finklestein's test



First Dorsal Compartment



de Quervain Tenosynovitis

- Imaging

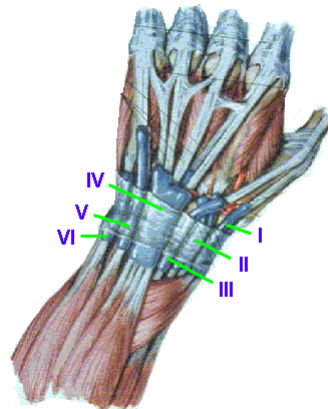
- Diagnosed clinically
- Wrist radiographs can be used to rule out other causes if diagnosis is unclear
- MRI



de Quervain Tenosynovitis

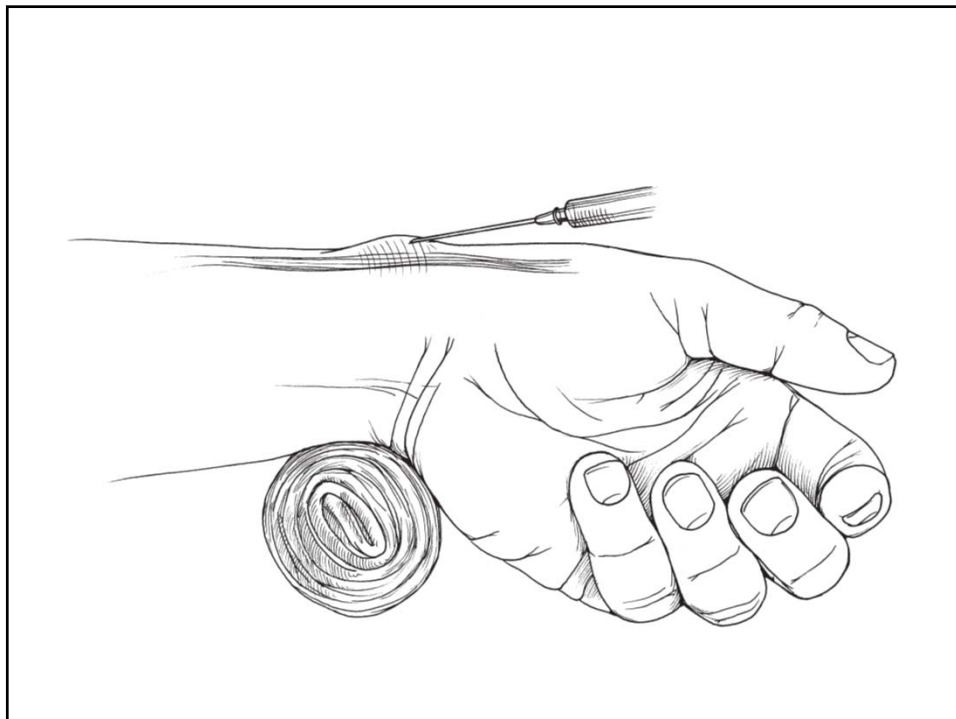
- Differential Diagnosis

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



Nonsurgical Treatment Options

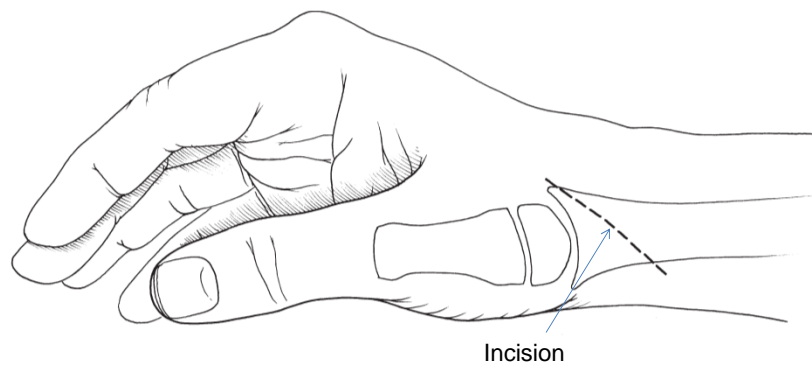
- Thumb/wrist immobilization using splint or brace
- Ice
- NSAIDs
- Improve arthrokinetics/
postural modifications
- Steroid injections



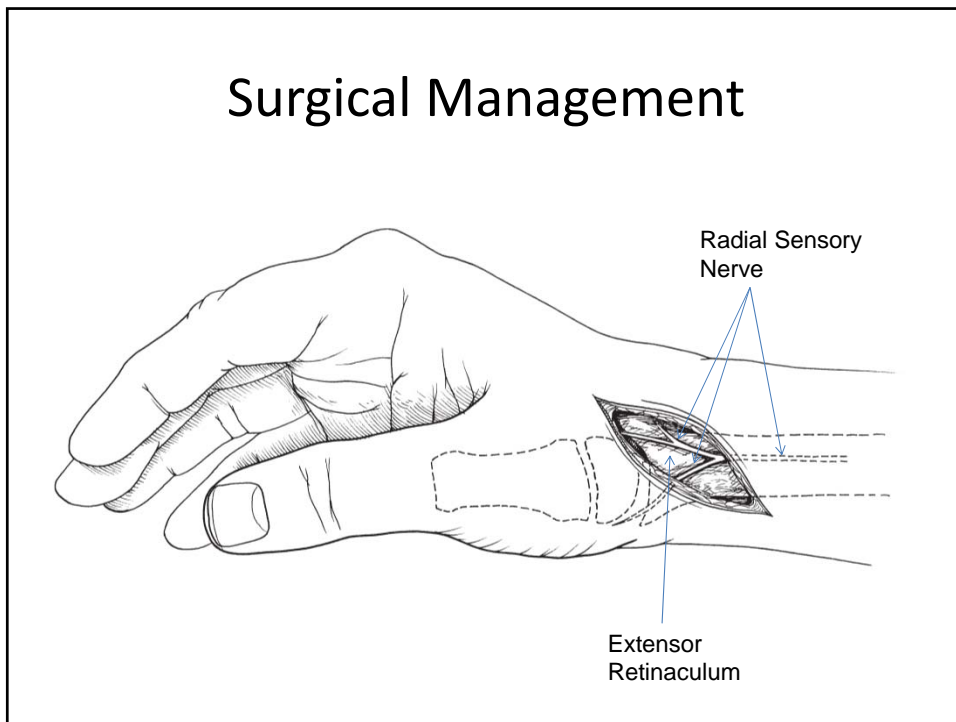
DeQuervain Tenosynovitis

- Surgical Treatment
 - Release of the fibro-osseous roof of the first dorsal compartment

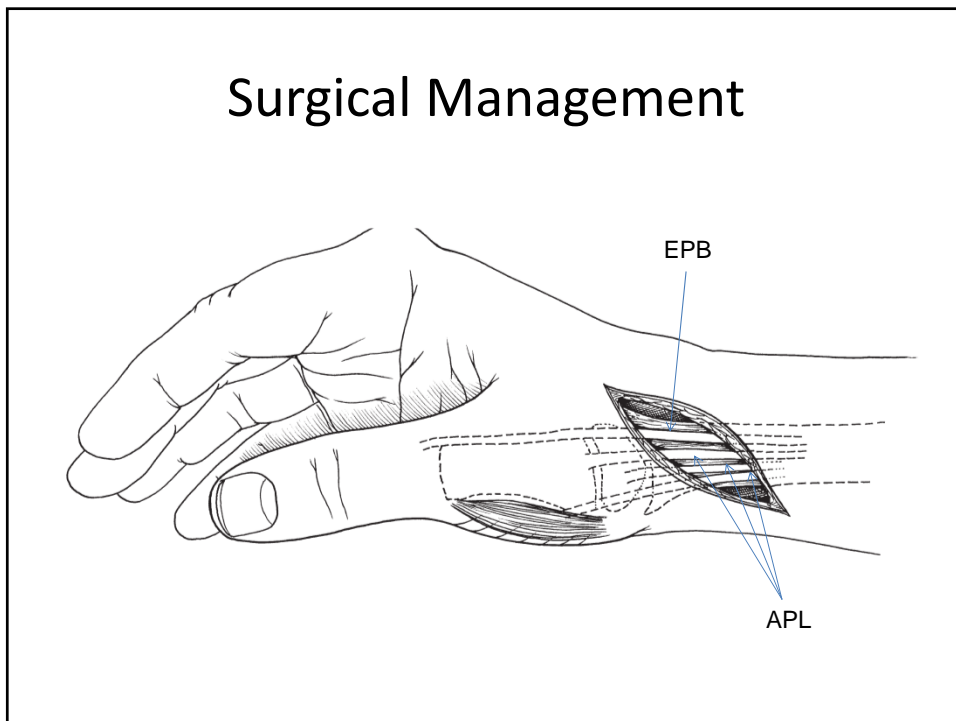
Surgical Management*



Surgical Management



Surgical Management



Carpal Tunnel Syndrome

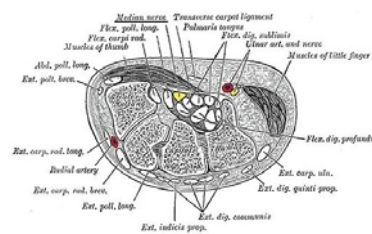
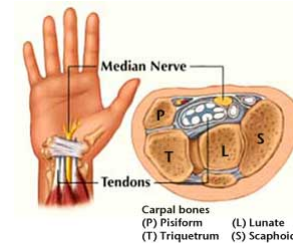
- Introduction
 - First described in 1854 by Sir James Paget in patients with distal radius fracture
 - Most common compressive neuropathy of the upper extremity
 - Caused by Median nerve compression in the carpal tunnel
 - May be Acute or Idiopathic

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

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



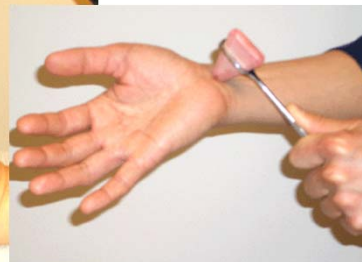
Tests for Carpal Tunnel



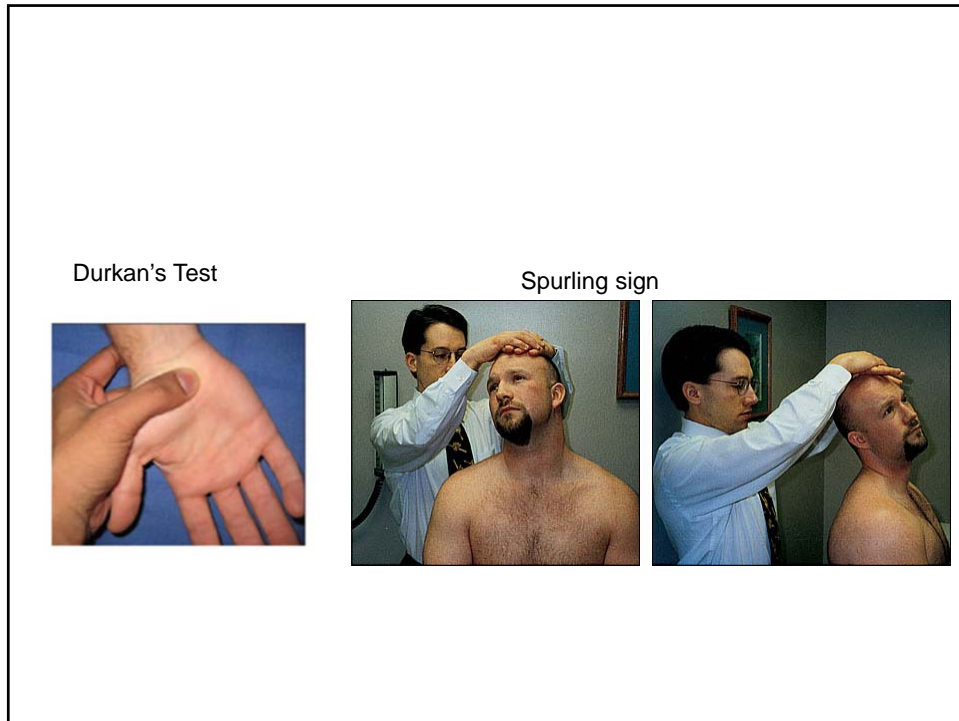
Phalen's test



Prayer test /
Reverse Phalen's



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

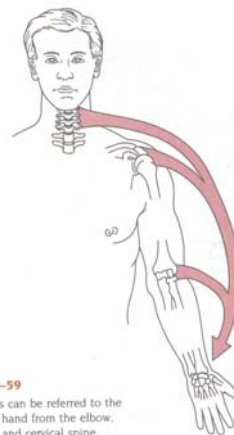


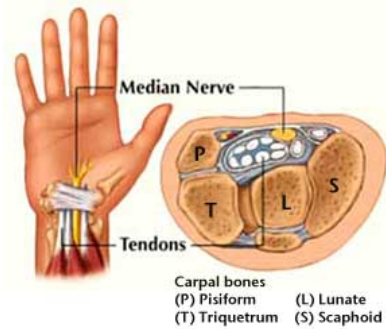
Figure 7-59
Symptoms can be referred to the wrist and hand from the elbow, shoulder, and cervical spine.

Carpal Tunnel Syndrome

- Nonsurgical Treatment
 - Splinting (night splints)
 - Oral Medications
 - NSAIDs
 - Oral Corticosteroids
 - Corticosteroid Injections

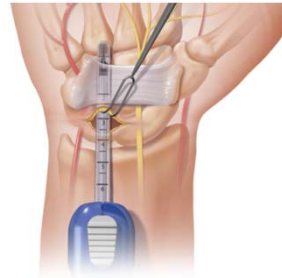
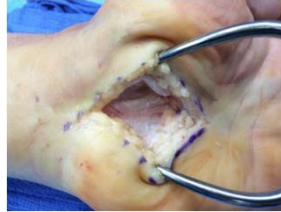
Goal of CTS Manual Medicine

- 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

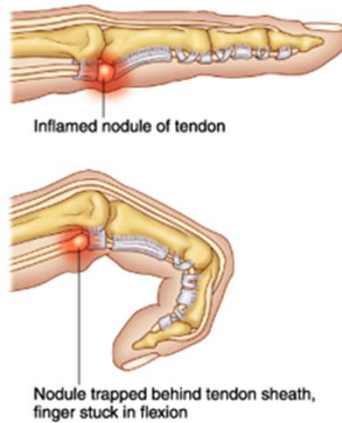


Trigger Finger

- 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



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

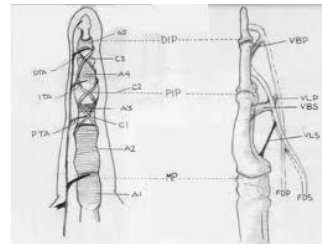
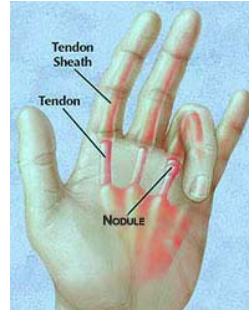
- Patient History
 - May report a mild, non painful click to inability to fully flex digit.

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:

- Scarpone, M. The efficacy if prolotherapy for lateral epicondylosis. Clin J Sport Med. 2008 May; 18(3) 248-254
- Keith, Michael et. al. Diagnosis of Carpal Tunnel. J Am Acad Orthop Surg 2009:17; 389-396.
- Cranford, CS. Carpal Tunnel Syndrome. J Am Acad Orthop Surg 2007; 15; 537-548.