Upper Extremity Overuse Injuries

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Lateral Epicondylitis (tennis elbow)

- Pathology
  - 30 – 50 years old
  - Repetitive micro-trauma
  - Chronic tear in the origin of the extensor carpi radialis brevis

Lateral Epicondylitis (tennis elbow)

- Mechanism of Injury
  - Overuse syndrome caused by repeated forceful wrist and finger movements
  - Tennis players
  - Prolonged and rapid activities

Tendinosis

- Collagen degeneration due to
  - ageing
  - microtrauma
  - vascular compromise
  - Degeneration and inadequate repair
  - Angiofibroblastic hyperplasia

- Evidence for decreased microcirculation and anaerobic metabolism in ECRB


Lateral Epicondylitis (tennis elbow)

- Clinical Signs and Symptoms
  - Increased pain around lateral epicondyle
  - Tenderness in palpation CET
- Tests
  - AROM: PROM
  - Resisted tests
  - Lidocaine
Treatment of Tennis Elbow

Management

• Non-operative
  – successful in 95%

• Operative
  – only after failed non-operative Rx
  – usually successful

Treatments

Common treatments for tennis elbow:
  – Rehabilitation.
  – Use of a forearm brace.
  – Use of injections of cortisone.
  – Strengthening and stretching exercises.
  – Rest, ice and compression.

Two Examples of Treatment
Operative options

- Open release
- Arthroscopic release
- Percutaneous release
- Suture anchor repair
- Microtenotomy
- Anconeus transposition
- Radiofrequency probe

Open release

- Incision ant to lateral epicondyle
- ECRL posterior fascial edge lifted
- Degenerate tissue within ECRB excised
- Defect firmly repaired
  - +/- suture anchors
- ?Decompression of PIN

Medial Epicondylitis (golfer’s elbow)

- Pathology
  - 30 - 50 years old
  - Repetitive micro trauma to common flexor tendon

Medial Epicondylitis (golfer’s elbow)

- Mechanisms of injury
  - Throwing a baseball
  - Racquetball or tennis
  - Swimming backstroke
  - Hitting a golf ball

Medial Epicondylitis (golfer’s elbow)

- Clinical signs and symptoms
  - Increased pain over medial epicondyle
  - Tenderness on palpation CFT
  - Tests
    - AROM; PROM
    - Resisted tests
    - Lidocaine
Treatments

Common treatments:
- Rehabilitation.
- Use of injections of cortisone.
- Strengthening and stretching exercises.
- Rest, ice and compression.
- Surgery

Ulnar Neuritis

• Pathology
  - Superficial position at the elbow
  - Excessive pressure in this area
  - Second most common entrapment neuropathy in the upper extremity

• Mechanism of injury
  - Compression of the ulnar nerve: cubital tunnel (epicondyle, olecranon, MCL, arch of arcuate ligament and of 2 heads of FCU
  - Elbow flexion tightens arch
  - Repeated rapid activities such as throwing and prolonged flexion may traction or compress nerve
  - Nerve can sublux out of tunnel

Ulnar Neuritis

• Clinical signs and symptoms
  - Sensory changes in classic ulnar distribution: little finger and ulnar side of ring finger
  - Positive elbow flexion test
  - Positive Tinel’s test
  - Weakness of grip
  - Deterioration of 2 point discrimination
  - Adductor Pollicus neuro-weakness
  - Neuro-weakness interossei (Wartenburg)

Sites of compression

• Elbow
  - Arcade of Struthers
  - Medial epicondyle
  - Olecranon groove
  - Cubital tunnel
  - Anomalous anconeus
  - Flexor pronator aponeurosis
Management

- Conservative
  - Indicated if paraesthesia is transient
  - Patient education about posture
  - NSAIDs for nerve irritation
  - Physiotherapy
  - Elbow extension splints

- 22 patients treated with night splint preventing elbow flexion beyond 60 degrees. Improvement of symptoms in every patient including 3 who had failed surgical decompression! Conclusion: Nocturnal elbow flexion aggravates symptoms.

Operative management

- Indications
  - Failure of conservative methods
  - Persistent paraesthesia
  - Progressive symptoms especially motor

- Options
  - Decompression in-situ
  - Decompression with transposition

Decompression in-situ

- Incision 8cm proximal and 6 cm distal to medial epicondyle
- Osborne ligament incised to open tunnel
- May be combined with medial epicondylectomy

Decompression with transposition

- May be indicated in:
  - Recurrence of symptoms after simple neurolysis
  - Acute fracture ORIF (prominent metalware)
  - Elbow arthroplasty (scarring)
  - Ulnar nerve repair
  - Cubital valgus
  - Arthritis with osteophytes formation
  - Recurrent dislocation of nerve

Decompression with transposition

- Anterior transposition to lengthen nerve and decrease tension
- Can be submuscular, intra-muscular or subcutaneous
- Held using fascio-dermal sling or suture

Medial Overload Syndrome in Throwers

- Pathology
  - Lateral joint line- compressive forces
  - Shear forces posteriorly in olecranon fossa
  - Tensile forces along medial joint line
Medial Overload Syndrome in Throwers

- Clinical signs and symptoms
  - Persistent medial elbow soreness
  - Arm fatigue is the 1st indicator of impending injury
  - Medial tenderness
  - Elbow pain

Medial Overload Syndrome in Throwers: Treatment

- Pre throwing stretches
- Adequate gentle warm up with gradual increase to higher velocity throws
- Post throwing stretching
- ICE after throwing
- Surgical intervention

Radial Tunnel syndrome/Posterior Interosseous Syndrome

- Pathology
  - Radial nerve compressed:
    - In the proximal radial tunnel anterior to the head of the radius where nerve supplies brachioradialis and ECRL, between the ulnar half of the ECRB and its fascia, and at the distal border of supinator.
  - Often mimics tennis elbow
Signs and Symptoms
• Classic S&S of lateral epicondylitis including pain on ROM and resistive testing; resisted supination > wrist ext.
• Maximum tenderness should be over the supinator muscle; 4 fingers breadth distal to the lateral epicondyle
• Pain can radiate up and down arm
• Weak grip
• Diagnostic local anesthetic block to CET

Carpal Tunnel Syndrome
• Median nerve compression within the carpal tunnel is the most common peripheral nerve entrapment syndrome.
• Any condition that decreases the cross sectional area of the carpal tunnel or increases the volume of its contents may cause the pathology.
  – Examples: lunate dislocation; distal radius fracture, sustained flexion or extension postures, fluid retention, synovitis

Signs & Symptoms of CTS
• Pain, paraesthesia, or numbness in the median nerve distribution distal to the wrist
• Nocturnal paraesthesias common complaint
• Clumsiness and decreased prehension; tip to tip opposition of tips of thumb and little finger
• Sustained wrist flexion brings on symptoms
Physical examination

- Phalen’s maneuver
- Tinel’s sign
- Weak thumb abduction.
- Two-point discrimination

Practice Point
CLINICAL STAGES OF CARPAL TUNNEL SYNDROME

- Stage I
  - Uncharacteristic discomfort in hand
  - No precise localization to median nerve
- Stage II
  - Symptoms localized to territory supplied by the median nerve
- Stage III
  - Impairment of digital function
  - Usually complains of clumsiness
- Stage IV
  - Sensory loss in median nerve distribution
  - Obvious wasting of thenar eminence
Treatment of CTS

• Eliminate risk factors such as take frequent rest breaks; ergonomic set up analysis and correction; decrease vibration and prolonged pressure, etc
• Neutral wrist splinting/rest/neural mobilization
• Check for double crush problem: elbow, shoulder, neck and treat corresponding areas
• Carpal tunnel cortisone injection
• Surgical release: failure of conservative tx or if significant thenar atrophy or sensory loss

ORAL MEDICATIONS

• Diuretics
• Nonsteroidal anti-inflammatory drugs (NSAIDs)
• pyridoxine (vitamin B6)
• Orally administered corticosteroids
  – Prednisolone
  – 20 mg per day for two weeks
  – followed by 10 mg per day for two weeks

LOCAL INJECTION

• 40 mg of methylprednisolone acetate (Depo-Medrol) or similar corticosteroid preparation is injected with a 25-gauge needle at the distal wrist crease (or 1 cm proximal to it).

SURGERY

• Should be considered in patients with symptoms that do not respond to conservative measures and in patients with severe nerve entrapment as evidenced by nerve conduction studies,thenar atrophy, or motor weakness.
De Quervain’s Tenosynovitis

- de Quervain’s Tenosynovitis occur when there is inflammation and/or entrapment of extensor pollicis brevis (EPB) and abductor pollicis longus (APL) tendon.
- It is precipitated by repetitive wrist motion, especially thumb flexion combined with ulnar deviation of the wrist.

DeQuervain’s Disease

- Pain at thumb side of wrist
- Worse with lifting and wrist twisting activities
- Often with swelling at thumb side of wrist
- Common in new mother’s from lifting baby

Pain and tenderness located over distal aspect of the radius below thumb CMC joint

Demonstration of Finkelstein’s test with the thumb in the palm and the wrist ulnarly deviated.
DeQuervain’s Disease

Treatment:
- Thumb Spica Splint
- Ice after work or activity
- Anti-inflammatory medications

DeQuervain’s Disease

Corticosteroid
Administered by injection or through therapy (iontophoresis)

Iontophoresis

DONE THROUGH THERAPY  USUALLY 4 TO 6 TREATMENTS

DeQuervain’s Surgery

Outpatient surgery
- Local or Regional Block Anesthesia

DeQuervain’s Surgery

Incision made over tendon tunnel

DeQuervain’s - Surgery

TENDON’S RELEASED
TUNNEL WIDENED