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MEDIAL ELBOW PAIN

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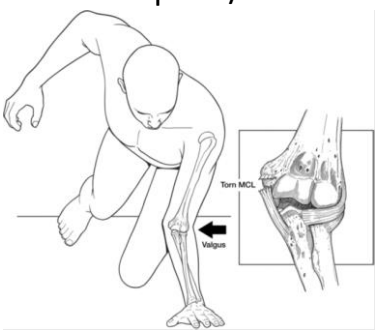
Orthopaedic Manual Physical Therapy Series
Charlottesville 2017-2018

UCL Sprain/Tear

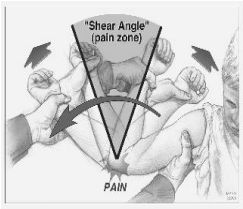


Valgus Instability/Ulnar Collateral Ligament Sprain

- History
  - Acute rupture-OH athletes
  - Persistent pain indicates partial tear
- Physical Exam
  - (+)TTP of anterior UCL
  - Valgus stress test at 25 deg elbow flexion
  - Moving valgus stress test(O'Driscoll 2005)
    - (+) btw 70-120 deg flexion
    - Sn 1.0, -LR 0.0
    - Sp .75, + LR 4.0
- Differential Diagnosis
  - Flexor/Pronator Strain
  - Medial Epicondylalgia
- Treatment
  - Immobilize elbow
  - Strengthen Pronator Teres
  - Gr III = Ortho Consult

Moving Valgus Stress Test

- (+) pain 70 to 120 deg elbow flex
- Elbow moved quickly from max flex to ext with valgus force
- Mimics late cocking/early acceleration

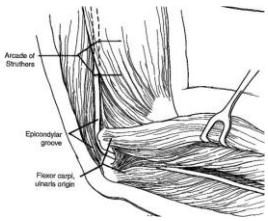


Cubital Tunnel Syndrome

- History
  - 2nd most common neuropathy in UE
  - Sensory changes 4th-5th digits
  - Medial elbow pain
- Physical Exam
  - Elbow Flexion Test
  - Wartenberg's Sign
  - Ulnar Nerve Compression Test
  - Froment's Sign

Cubital Tunnel Syndrome

- Differential Diagnosis
  - Cervical Radiculopathy
  - TOS
  - Ulnar compression at wrist
  - 1st rib syndrome
- Treatment
  - Rest, avoid elbow flexion ADLs
  - Night splinting in elbow flex < 30 deg 4-6 weeks

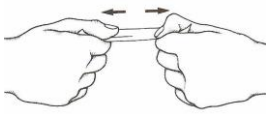


Cubital Tunnel Syndrome Special Tests

- Elbow Flexion Test
  - 60 second hold, (+) for paresthesias
    - Sn .75, -LR .25
    - Sp .99, +LR 75
- Wartenberg's Sign
  - Inability to adduct 5th digit

Cubital Tunnel Syndrome Special Tests

- Ulnar Nerve Compression Test (Novak, 1994)
  - Pressure to nerve in 20 deg flexion for 60 seconds
  - Sn .89, -LR .11
  - Sp .98, +LR 44.5
- Froment's Sign
  - Key chuck grip of paper b/w thumb and index finger
  - Weakness of Adductor Pollicis and 1st Dorsal Interosseous allows paper to be pulled



Medial Epicondylalgia

- History
  - Common with valgus activities
  - FCR and PT tendons commonly involved
- Physical Exam
  - (+)TTP medial epicondyle
  - Pain with RSC wrist flex and forearm pronation
  - Grip strength usually unaffected
  - Ulnar nerve symptoms often coexist
- Differential Diagnosis
  - Ulnar neuropathy
  - UCL sprain
  - Pronator Syndrome
  - Cervical Radic
- Treatment
  - Stretching wrist flexors
  - Eccentric strengthening exercises
  - Shoulder stabilization/core training

The Prevalence of Medial Epicondylitis Among Patients With C6 and C7Radiculopathy;*Sports Health: A Multidisciplinary Approach* *2010,* American Orthopaedic Society for Sports Med

- 102 pts initially diagnosed with cervical radiculopathy.
- They were then examined for medial epicondylitis.
- 55 pts diagnosed with medial epicondylitis
  - 44 pts with C6 and C7 radiculopathy,
  - 11 with only C6 radiculopathy.

The Prevalence of Medial Epicondylitis Among Patients With C6 and C7Radiculopathy;*Sports Health: A Multidisciplinary Approach* *2010,* American Orthopaedic Society for Sports Med

- Medial epicondylitis presented with cervical radiculopathy in slightly more than half the patients.
- Hypothesized weakening of the FCR and pronator teres and imbalance of the flexor and extensor muscles from the C6 and C7 radic allow for easy onset of medial epicondylitis.
- Patients with medial epicondylitis should be examined for C6 and C7 radiculopathy to ensure proper treatment

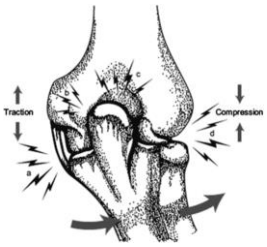
Valgus Extension Overload Syndrome

(Posteromedial Impingement via Ulno-humeral Compression)

- History
  - "locking, catching" and medial elbow pain
  - Typically present w/throwing and serving in sports
- Physical Exam
  - Flexion contracture
  - Painful active extension w/crepitis
  - PROM painful in pronation, valgus, extension
  - TTP posteromedial olecranon

VEO Syndrome

- Combined motion of valgus pressure with powerful extension of the elbow during acceleration phase of throwing.
- Leads to posterior osteophyte formation due to impingement of the posterior medial aspect of the ulna against the trochlea and olecranon fossa
- Can be chondromalacia in the medial groove of trochlea which preceeds osteophyte formation



VEO Test

- Passively extend pt's elbow from 30 deg flex to full extension while maintaining a moderate valgus stress
- Attempts to stress a potential posteromedial osteophyte abutting medial trochlea and olecranon fossa
- Meant to simulate stresses during acceleration phase of throwing
- (+) Test is reproduction of pain at posteromedial elbow

VEO Pattern Recognition

- Subjective
  - "locking, catching" and medial elbow pain
  - Typically present w/throwing and serving in sports
- Physical Exam
  - Flexion contracture
  - Painful active extension w/crepitis
  - PROM painful in pronation, valgus, extension
  - TTP posteromedial olecranon

ELSEVIER SAUNDERS
CLINICS IN SPORTS MEDICINE
Clin Sports Med 23 (2004) 545–552

Kinetic chain contributions to elbow function and dysfunction in sports

W. Ben Kibler, MD*, Aaron Sciascia, MS, ATC
Lexington Clinic Sports Medicine Center, 1221 S. Broadway, Lexington, KY 40504, USA

Research on Kinetic Chain Factors Influencing Elbow Joint Mechanics

- Kinetic Chain Factors
  - Efficient proximal segment activation minimizes the need for high force generation in the distal segments
    - Anticipatory Postural Adjustments (APA's) in the LE and trunk allow proximal stability in order for the distal segments to have max mobility
    - In tennis players between 63% and 74% of the kinetic energy and force delivered to the hand was developed by the hip/trunk or shoulder segments

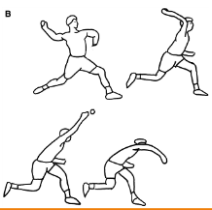
Research on Kinetic Chain Factors Influencing Elbow Joint Mechanics

Marshall and Elliot, J Sports Sci 2000

- Long-axis Rotation
  - Coupled motion creating rotation around the almost-straight long axis of the arm, running from the shoulder to the hand
  - Minimizes valgus loads at elbow
  - Without elbow elevation and extension before max shoulder rotation--increased tensile loads at elbow ligaments during arm acceleration.
  - "Dropped elbow," --term for the elbow being positioned below the level of the shoulder in the acceleration phase.

Research on Kinetic Chain Factors Influencing Elbow Joint Mechanics

Long-axis Rotation



Coupled shoulder internal rotation and forearm pronation, to maximize centripedal arm motion and minimize valgus strain at the elbow joint.
Key biomechanical event just before ball release/ball impact

Research on Kinetic Chain Factors Influencing Elbow Joint Mechanics

- Glenohumeral Internal Rotation Deficit (GIRD)
  - Elbow valgus load is primarily developed by the interactive moment generated by shoulder internal rotation.
  - 20/20 consec professional baseball pitchers w/elbow symptoms were found to have GIRD of > 25 deg.
  - Correction of the 25 deg deficit correlated w/relief of symptoms

Morgan C.D. American Shoulder and Elbow Surgeons Mtg October 2002

Kinetic Chain Assessment

- Before onset of elbow pain common reports:
  - Ankle sprain on the contralateral (plant foot) side.
  - Shoulder pain or decreased function (ball velocity or ball location
- Physical examination
  - Pronounced LB lordosis--decreases core trunk stability and APAs.
  - Trunk flexibility-LB AROM
  - Hip ROM-frequently limited rotation
  - One Leg stability series
  - Shoulder assessment

One Leg Stability Series

- The one-leg stability series is a screening measure of trunk stability over the planted leg. The trunk should demonstrate a negative Trendelenberg sign and no rotational compensations
- **Single leg stance** **Single leg squat**

Kinetic Chain Shoulder Assessment

- Scapular dysfunction alters stable platform for long axis rotation
  - Affects elbow by not allowing full cocking when the scapula is excessively protracted.
- Asymmetric loss of IR (GIRD) is absolute IR < 25 deg or side to side differences of > 25 deg
  - Goal is to bring side to side differences to < 25 deg
- Assess RC strength
- Test for shoulder instability and labral injury

Shoulder Assessment

- GIRD
  - Look for asymmetrical internal rotation with the scapula stabilized.

- Scapular exam
  - Look for abnormal scapular position at rest and during AROM

Glenohumeral Internal Rotation Deficits in Baseball Players With UCL Insufficiency

- Significant difference in dominant arm internal rotation when comparing UCL deficient (less IR) vs normal
- UCL deficient throwers had significantly greater GIRD than asymptomatic control (28.5° vs 12.7°).
- Total range of motion was significantly decreased in the injured group
- Pathologic GIRD may be associated with elbow valgus instability

AJSM 2009 GIRD in Baseball Players With UCL Insufficiency

A Randomized Controlled Comparison of Stretching Procedures for Posterior Shoulder Tightness

- 54 asymptomatic subjects
- 3 groups: control, sleeper stretch, cross body stretch
- Stretch 1x/day 5x 30sec each
- Control group gained 5.9° IR
- Cross-body stretch group gained 20.0° IR (significant vs control)
- Sleeper stretch group gained 2.4° were not significant compared to those of the control group and those of the cross-body stretch group.

march 2007 journal of orthopaedic & sports physical therapy

VEO Rehab Protocol

- Initial treatment : dec posterior elbow pain/inflammation
- As pain dec and ROM normalizes initiate dynamic stabilization and strengthening exercises of shoulder and elbow
- Eccentric training of the elbow flexors
  - Need to control rapid elbow extension that occurs during throwing
  - Addition of forceful, rapid triceps extension, especially performed rapidly for throwing simulation
    - Manual resistance of concentric and eccentric elbow flexion
    - Tubing concentric/eccentric elbow flexion

Clin Sports Med 23 (2004)

Subsequent Treatments

- Progressive RC and scap stabalizer therex
  - Emphasis of lower trap and serratus anterior for dynamic stabilization

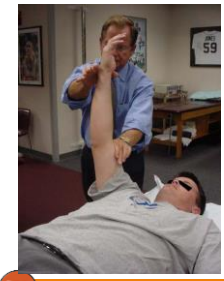
Concentric/Eccentric Lower Trap and Retractors

Subsequent Treatments

- After Active Rest period, add basic concenctric/eccentric wrist and elbow therex
- Due to anatomic orientation of FCU and FDS at the site of the UCL, isotonic and stabilization activity for these mm may assist in medial elbow stabilization in OH throwing motion
- Progress to sport specific drills

Rhythmic Stabilization

- D2 Resisted Reversal



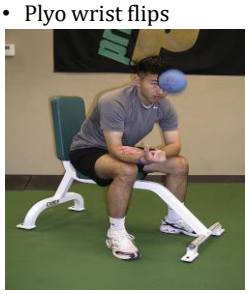
- Elbow flex/ext rhythmic stabilization

Throwing protocol-Surgical and Nonsurgical

Functional retraining

- Ball dribbling for distal

- Plyo wrist flips



Functional Retraining

- Plyo wrist snaps

- Shoulder IR plyo

Reverse Catch Plyo

- Eccentric load to posterior cuff w/rapid concentric ER when pt throws the ball back
- UE maintains 90deg shoulder and elbow Abd
- Begin w/2 arms progressing to one arm loading

Defining the Phase of the Throwing Motion Where Pain Occurs—Structures Involved

- Early cocking
  - Distal biceps tendonitis
  - Distal triceps tendonitis
- Late cocking
  - UCL strain/rupture
  - Ulnar neuritis
- Acceleration
  - UCL strain/rupture
  - Ulnar neuritis
  - VEO syndrome
  - Flexor-pronator mass strain
  - Pronator teres syndrome
  - Panner's disease
  - OCD lesion of the capitellum

Defining the Phase of the Throwing Motion Where Pain Occurs—Structures Involved

- Follow-through
  - Flexor-pronator mass strain
  - Pronator teres syndrome
  - VEO syndrome
  - Panner's disease
  - OCD lesion of the capiteilum
- Deceleration
  - VEO syndrome
  - Distal biceps tendon avulsion
  - Distal biceps tendon strain
  - Brachialis strain

Operative Techniques in Sports Medicine, Vol 4, No 2 (April), 1996: pp 77-83

Regional Elbow Pain