Project: Ghana Emergency Medicine Collaborative

Document Title: Overuse Syndrome

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Overuse Syndrome

Joseph H. Hartmann, DO

A rose is a rose...

- Overuse syndrome
- Repetitive stress disorder / injury
- Repetitive motion disorder / injury
- Repetitive strain disorder / injury
- Cumulative trauma disorder
- Musculoskeletal disorder

What is it?

- Repetitive activity over a variable course of time resulting in damage to tissue, usually muscular or ligamentous / tendinous (nerve entrapment also included).
- Repetitive activities
 - Occupational
 - Recreational (sport-related)
 - Habitual (Nintendo thumb, Nintendinits, gamer's

thumb, PlayStation thumb)



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Bart, Elickr

Pathophysiology

- Tissue adaptation can not occur preventing healing
- Persistent trauma causes escalating injury
 - Mechanical effects
 - Biochemical effects
 - Free radicals, prostaglandins, proinflammatory interleukins
 - ? Genetic effects

Clinical Presentation - Hx

- Begin with PQRST questions
- More specific detailing of suspected offending activity
 - Repetitive activity (mechanism)
 - Technique employed
 - Limbs malpositioned from neutral position
 - Equipment used / worn

Clinical Presentation – P.E.

- Tenderness
- Diminished ROM (active / passive)
- Diminished strength
- Tissue edema (?)
 - Swelling of bursae, synovial sheaths
- Evidence of musculoskeletal compensation
- Classically recognized presentations

Laboratory Studies

- May or may not be indicated
- General metabolic
 - CBC, comprehensive medical panel with liver function testing, TSH
- Rheumatologic
 ESR, CRP, ANA, RPR

Imaging Studies

- May or may not be indicated
 - Acute on chronic injury
 - Significant worsening changes (unexplainable)
 - Mechanism of injury questioned

Radiographs

- Bony avulsions
- Stress fractures
- Chronic tendonitis

 Calcification of tendons
- Myositis ossificans

Bone scan / CT
 Stress fractures



Source Undetermined



Ø PD-INEL

Ultrasound

- Ligament and tendon pathology
 Opportunity for dynamic examination
- Higher resolution transducers provide higher spatial resolution rivaling MRI
- Procedural and professional costs are 20% that of comparable MRI study

Magnetic Resonance Imaging

- Historically more effective with acute injury than with more subtle findings associated with chronic injury
- Newer generation units, increasing experience, use of gandolinium enhancement with fat saturation (identifies inflammation) has provided excellent soft-tissue resolution

Electrodiagnostic Studies

• EMG - NCT

- Peripheral nerve compression / injury
 - Location
 - Severity
- MRI ?

Treatment

- Rest
- Analgesics
- Immobilization (?)
- Physical therapy
 - Supervised
 - To more carefully plan tx program
 - Use of modalities
 - Patient education
 - Home exercise program

Treatment

- Occupational therapy
 - Tailor physical therapy
 - Identify workplace modifications
- Sports medicine therapy
 - Sport specific physical therapy
 - More knowledgably address
 - Training issues
 - Technique flaws
 - Ill-fitting equipment

Treatment

• Steroid injections

 Ligaments and tendons can undergo structural weakening leading to potential rupture

- Surgery
 - Failed conservative management
 - Nerve decompression
 - Ligament repair (laxity)
 - Dismal outcomes if performed for subjective pain relief without objective findings

Shoulder

- Impingement syndrome
 - Compression of supraspinatus tendon and subacromial bursa
 - Pain with abduction (Neer maneuver) and flexion / internal rotation (Hawkins maneuver)
 - Subacromial tenderness
 - Normal ROM
 - Normal strength

National Institute Of Arthritis And Musculoskeletal And Skin Diseases, Wikimedia Commons

Elbow

- Epicondylitis
 - Lateral epicondylitis
 - Extensor carpi radialis brevis and longus
 - "tennis elbow"
 - Medial epicondylitis
 - Flexor carpi radialis
 - "golfer's elbow"
 - Pain with strong gripping
 - Decreased grip strength
 - Normal ROM

Wrist and Hand

- Carpal tunnel syndrome
 - Median nerve entrapment
 - Symptoms typically worse at night
 - Typical sensory distribution
 - Flattening of thenar eminence
 - Thumb adduction weakness
 - Hoffman-Tinel test tapping
 - Phalen maneuver flexion

Wrist and Hand

- deQuervain's tenosynovitis
 - Involves abductor pollicus longus and brevis
 - Repetitive gripping / grasping motions
 - Local tenderness over radial styloid region
 - Pain with resisted thumb extension/abduction
 - Pain with passive ulnar deviation with thumb adducted in palm – Finkelstein maneuver

PhilippN, Wikimedia Commons

Ø PD-EXP

Gray's Anatomy, <u>Wikimedia Commons</u>

Hip

- Snapping hip syndrome
 - Usually from "iliotibial band snap"
 - Snapping of thick,wide iliotibial tendon over greater trochanter with hip extension
 - Snapping sensation
 - Audible "pop"
 - Commonly seen in runners
 - May cause a trochanter bursitis

Knee

- Patellofemoral pain syndrome (chondromalacia patella) – "runner' s knee"
 - Pain posterior to patella / anterior knee
 - Pain with compression of patella or with resisted knee extension
 - Repetitive irritation increased lateral forces on patella
 - More commonly seen in women (anatomy)

Kari Stammen, Wikimedia Commons

Medial Tibial Stress Syndrome

- "shin splints"
- Posteromedial margin of tibia
- Dull aching discomfort relieved by rest
- Progresses to worsening discomfort not relieved by rest
- ? Hyposthesia over fourth toe
- r/o stress fx "female athlete triad"

en:Anatomography, Wikimedia Commons

Chronic Compartment Syndrome

- Masquerades as other pain syndromes
- Aching pain or cramping within 10-30 min in region of particular compartment
- Exaggeration of normal exercise response

 Increased blood flow = increased muscle volume = decreased blood flow = compartment pressures above 20 mmHg
- Return to normal function between episodes
- Non-urgent fasciotomy (?)

Sarte, Wikimedia Commons

Ankle / Foot

- Achilles tendonitis
 - Heel pain
 - Worse with dorsi-flexion
 - Retrocalcaneal bursa involvement
 - Swelling, erythema, warmth

Posterior Tibial Tendonitis

- Pain over medial ankle
 - Worse with inversion
 - Inability to stand on toes
 - Tenderness over tendon sheath
 - Often pronated flat foot found = overly-inverted
- Tarsal Tunnel Syndrome

– Nerve entrapment of posterior tibial nerve

Plantar Fasciitis

- Involves plantar aponeurosis
- Plantar heel and / or mid-foot pain
- Passively dorsi-flex toes and palpate sole
- Bilateral presentation 1/3 of patients

Lucien Monfils, <u>Wikimedia Commons</u>

Finally

- Lengthy recovery times
 - -4-6 weeks common
 - 6 months possible
- Return to pre-injury activities
 - Complete resolution on pain
 - Full range of motion
 - At least 90% recovered strength
- Prevention
 - Education
 - Modification