**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, Nintendinitis, gamer’s thumb, PlayStation thumb)
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
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 gadolinium 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
The Shoulder Joint

- Acromioclavicular (AC) joint
- Acromion
- Clavicle
- Bursa
- Rotator Cuff Tendons:
  - Supraspinatus
  - Subscapularis
  - Teres Minor
  - Infraspinatus (behind, not shown)
- Humerus
- Biceps muscle
- Glenohumeral joint
- Scapula
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
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)
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”
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 (?)
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
Most Frequent Area of Pain mapped from 2666 PF Testimonies

11% = All 3 Areas
4% = All 8 Areas
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