Tendinopathies Enthesopathies, Overuse Injuries and Alphabet Soup

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Science

• Need for continually assessing the quality of evidence for therapeutic interventions.
• Need for reassessing our management of chronic tendinopathies.
Levels of evidence

- Levels of evidence are graded 1-4, with isolated or retrospective cases studies being rated as Level 4 (lowest) and randomised double blinded prospective studies rated Level 1.
- There is no level 1 evidence (according to level of evidence guidelines) for jumping out of aircraft with or without the use of a parachute. All retrospective case studies.
Levels of evidence

- Anecdotal reports often are coloured by observer bias.
- I still prefer modalities or treatments which lead to an immediate or rapid improvement in symptoms and function, where all previous treatment has failed.
- “The uncommonness of common sense”
- Oscar Wilde
Biomechanics of pronation, lower limb and lumbopelvic torsion

- Not just impact,
- Torsional loadings
- Sheer, stress, strain,
- Different tissue qualities,
- Muscle, tendon, bone, fascial junctions
- Ground reaction forces (may be > 10 body mass) affect biomechanical chain
Principles of Treatment

- Correct Training Errors
- Check and Correct Shoes
- Check and Correct Biomechanics/Gait
- Balance=” wear and tear vs repair”
- “Relative rest” Reduce or change activity,
- Swim, cycle, row
- Complete rest leads to cardiovascular and neuromusculoskeletal attrition.
Definitions

• Fascia is specialised connective tissue that may encase muscle groups, organs or lie in tissue planes. There is rich innervation.

• Entheses are points of attachment of tendons and ligaments onto bone. Specialised connective tissue (Sharpey’s) fibres blend the muscle tendon unit into bone.

• Tendinopathy Tendinosis vs tendinitis
Common Tendinopathies/Enthesopathies

• Supraspinatus tendinopathy (rotator cuff)
• Common Extensor Origin Enthesitis (CEO)
• Common Flexor Origin (CFO)
• Patellar Tendinosis
• Achilles Tendinosis
• Plantar Fasciosis
• Medial Tibial Enthesosis (Shin splints)
• This is a really cheerful list
Why “- osis”

- Histology shows these are degenerative conditions, not inflammatory (“-itis”).
- Histology - Degenerative tenocytes, fibroblasts, chondrocytes
- These conditions account much long term misery in defence and civilian practice
- A patient with multiple site of entheseal pain should be investigated for seronegative arthropathies HLA B27,
- Ankylosing spondylitis, enteropathic arthritis, psoriatic arthritis, Reiters syndrome
Diagnosis

• History, History, History
• May be triggered by direct contact, “bump”
• Usually insidious onset
• Recurrent, chronic, debilitating

• Direct palpation of the affected anatomy.
• Repeated imaging may not help clinical management.
HSDI
Alphabet Soup

• ABI  Autologous Blood injection
• PRP  Platelet Rich Plasma
• LACSI  Local Anaesthetic Corticosteroid Inj
• GTN  Glyceryl Trinitrate
• LIPUS  Low Intensity Pulsed Ultrasound
• ECSWT  Extracorporeal Shock Wave Therapy
• HBO  Hyperbaric oxygen
Alphabet Soup 2

- RICE Rest Ice Compression Elevation
- HARM Heat Alcohol Running Massage
- Bupivicaine, Mepivicaine – toxicity to chondrocytes, myocytes, Tenocytes
- NSAIDS – interfere with extracellular matrix, collagen and muscle regeneration
- LASER
Treatment

- Ice, Massage, Deep Frictions, Digital ischaemic pressure, acupuncture, “Therapeutic ultrasound” Sham ultrasound, iontophoresis, electrotherapeutic modalities, trigger point injections, autologous blood injections, PRP, sclerotherapy (polydochanol)
- Magnets
- Dry needling
- Eccentric/concentric exercises
  Tennis elbow brace
- Topical and oral NSAIDs
- Corticosteroid Injections (? U/S guided)

Time!
Treatment

• The great variety of treatments indicates that there is no one gold standard treatment. This may be changing.
GTN patches

- Minitran or Nitrodur 5mg/24 h
- 15 mg common for angina
- Can be cut into 1/8-1/4 wedges or strips
- Apply directly to tender area.
- Change every 24 h, 2-3 months
- Nitric Oxide signalling for endothelium, tissue repair, pain modulation. (Google Scholar)
- Headaches, - 1/16
Supraspinatus Tendinosis
Supraspinatus Tendinosis

- Common Rx
- “rotator cuff exercises.
- NSAIDS
- LACSI
- Surgery (arthroscopic subacromial decompression, bursectomy, SST debridement +/- repair)
CEO and CFO

- CEO (tennis elbow, lateral epicondylitis)—tender lateral epicondyle of elbow,
- Pain gripping, shaking hands, lifting weight
- Resisted palmar flexion whilst gripping

- CFO less common, painful gripping
“Treatments

• Activity modification
• Eccentric/concentric exercises
• Tennis raquet grip size, string tension, weight, technique
• LACSI commonly used ( +/- U/S guidance)
• Lancet and BJSM 2010, 2012-CEO recurrence at one year with LACSI 22%, 11%, without
Treatment

- Local Anaesthetic Lignocaine
- Multiple passes with 29 G needle down to bone. “PC tenoplasty “
- 1980’s study
- ¼ 5mg Nitrodur patch per /24h 2-3months
- Light (400gm +), exercise band, opp hand eccentric/concentric exercises
- Surgery occasionally
Treatment --- Nitric Oxide patch
Patellar Tendinosis

• History and palpation
• Ultrasound adds little to diagnosis
• Symptomatic vs asymptomatic U/S changes
• MRI
• DD Infrapatellar fat pad impingement
• Superficial infrapatellar bursitis, PFJS
• Treatment, exercise, GTN, orthoses
MRI, U/S Achilles tendiosis
Achilles Tendinosis, Paratendinitis

• Dx H & E
• Tenderness +/- swelling, 95%+ medial
• Imaging  HSDI, U/S, MRI
• Rx Training, stable shoes, eccentric exercises, orthotics with midfoot control, rear foot varus wedge
Varus wedge correcting TA mechanics
Treatment

- Eccentric/concentric exercises
- Nitrodur patches
Nitrodur patches 1.4/5mg/24h

Eccentric/concentric exercises

“Alfredson’s painful heel drop protocol”

Figure 32.7 Alfredson’s painful heel-drop protocol for Achilles tendinopathy. The heel-drop protocol consists of two key exercises: the ‘gastrocnemius drop’ and the ‘soleus drop’.

(a) For the gastrocnemius drop, the patient begins in a demipointe position, with the heel raised and the

(c) For the soleus drop, the patient again adopts the demipointe position with the heel raised, but for this exercise the knee should be flexed to 45° so that the soleus is engaged.

(d) The patient lowers the heel so that the foot is parallel with the ground.
Plantar Fasciosis

• Dx—Pain on getting out of bed, or after sitting
• Localised to plantar fascial insertion on calcaneus
• Plantar fascial strain- acute injury, usually more mid to anterior plantar fascia
• Hobbling then warms up
• Recurs with weight bearing
Plantar Fasciitis - Treatment

- Rx
- Stretch and Strengthen
- Activate toe flexors
- Sports taping
- Orthotics, plantar fascial groove, rear foot varus, medial arch support
Barefoot Running
The Future

- Growth factors, Stem cells
- The present– Eccentric/concentric exercises, GTN patches
- Appropriate orthotics for lower limb biomechanics.
- A referral to physio should be a scientifically based exercise prescription.
- Do you write a script Rx “DRUG”
References

• Google Scholar, Medline etc
• Brukner and Khan “Clinical Sports Medicine 4th ED
• Nordin & Frankel “Basic Biomechanics of the Musculoskeletal System” 4rd Ed
• Moore “Clinically Oriented Anatomy” 6th Ed
• Stoller MRI in Orthopaedics and Sports Medicine 3rd Ed
• Seidenberg Sports Medicine Resource Manual
Treatment of Tendinopathy

What Works, What Does Not, and What is on the Horizon

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Abstract  Tendinopathy is a broad term encompassing painful conditions occurring in and around tendons in response to overuse. Recent basic science research suggests little or no inflammation is present in these conditions. Thus, traditional treatment modalities aimed at controlling inflammation such as corticosteroid injections and nonsteroidal anti-inflammatory medications (NSAIDS) may not be the most effective options. We performed a systematic review of the literature to determine the best treatment options for tendinopathy. We evaluated the effectiveness of NSAIDS, corticosteroid injections, exercise-based physical therapy, physical therapy modalities, shock wave therapy, sclerotherapy, nitric oxide patches, surgery, growth factors, and stem cell treatment. NSAIDS and corticosteroids treatments. Preliminary work with growth factors and stem cells is promising, but further study is required in these fields. Surgery remains the last option due to the morbidity and inconsistent outcomes. The ideal treatment for tendinopathy remains unclear.

Level of Evidence: Level II, systematic review. See the Guidelines for Authors for a complete description of levels of evidence.

Introduction

Traditionally, pain in and around tendons associated with activity has been termed tendonitis. This terminology
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Overuse Injuries, Tendinopathies, Enthesopathies, Bone stress, exertional leg pain, spinal pain and the biomechanical group of injuries account for the greater part of chronic clinical morbidity, direct costs, reduced hours worked, J MEC downgrades and medical discharges in the ADF. Up there with Mental Health issues. Most health practitioners are not well trained in difficult musculoskeletal, sports and rehabilitation medicine.
If you have a difficult, slow or nonresolving Musculoskeletal case - do some research. Keep a copy of Brukner and Khan “Clinical Sports Medicine 4th” by your side - essential in military musculoskeletal medicine. Know your science.

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