Exercise Induced Lower Leg Pain and Exertional Compartment Syndrome

Dr. Paul Annett (MBBS, FACSP)
Sports Physician
Visiting Fellow UNSW
Lower Leg Pain

• Why is Lower leg pain important?

• Common problem in athletes
• 20% running injuries
• Second only to the knee (MacIntyre ‘91)

• CECS commonly missed!
Case History

- 30 Y.O male
- Recently returned to running for fitness
- Bilateral ‘claudicant’ type anterior shin pain
- Legs are ‘hard’ after exercise
- Gradual deterioration over 3 months
- Previously had similar symptoms that stopped him from playing football
Diagnoses of Chronic Leg Pain

- Stress #
- Tibial periostitis
- CECS - Anterior & Deep posterior
- PAES
- Neuropathy
- Venous disease
- Tendinopathy
- Referred pain
Tenoperiostitis

- Initially may warm up
- Long duration of post-exercise discomfort
- Pain directly on tenoperiosteal junction
- Junction of upper 2/3 & lower 1/3 of tibia
- Soleus, tib. Post, FHL
Stress Fracture

- Failure of normal bone under abnormal stress
- Insidious onset of pain
- Increases with impact activities
- Progresses to rest & night pain
- Focal bony tenderness on palpation + ‘hop’ positive
Chronic Exertional Compartment Syndrome

- ‘Crescendo’ pain
- Commonly bilateral
- Compartment tightness
- Non-specific ache
- Neurological changes
Chronic Exertional Compartment Syndrome

• Dr. Edward Wilson
  1912 – South Pole
• Mavour ‘56
• ‘An increased pressure within a limited space’
  • (Matsen ‘81)
• 5 compartments in the lower limb
Chronic Exertional Compartment Syndrome

- Pathophysiology – difficult to define
- Raised compartment pressure
  - Fascial factors
  - Muscle hypertrophy
  - Tissue edema – 20% increase with exercise
- Relative ischaemia – Increased serum lactate
- Studies against – blood flow imaging
- Other Theories:
  - Sensory receptor stimulation in fascia
  - Biochemical factors
Investigation

- Plain X-Ray
- Tc 99 Bone scan
  - Focal uptake in stress #
  - Linear uptake in periostitis
- Compartment pressure testing
- MRI
- Others
Diagnostic Procedure

- Intracompartmental pressure measurement
- Pedowitz criterion
  - Pre > 15mmHg
  - 1’ post > 30mmHg
  - 5’ post > 20mmHg
- Measurement variability
- Other experimental procedures
Diagnostic Procedure
Treatment - Periostitis

• Reduce activity
• Anti-inflammatory treatment
• Myofascial release
• Muscle stretching
• Correct biomechanical abnormalities
• Strengthen invertors

Surgery
Treatment - Stress Fracture

- Pain free weight bearing as tolerated until fracture non-tender
- Gradual return to activity
- Correct training errors & other pathology (eg. Female athlete triad)
- Care with the ‘Dreaded black line’
Treatment - DPCS

- Conservative treatment unhelpful - the surgeons opinion!
- Aggressive deep tissue therapy
- Stretching program
- Correct biomechanical abnormalities
- Limited literature
Treatment – Anterior Compartment Syndrome

- Aim treatment at myofascial release
  - Olympic Park pilot
- Good surgical results
- >90% success
  - (Schepsis ‘93)
- Olympic Park ’02
  - ? As good
  - Within 12 months
Treatment - DPCS

- Surgical treatment
- Failure of conservative treatment
- Release of fascial envelope
- Multiple procedures
- Less successful than anterior release
  - (Schepsis ‘93)
  - Consider Olympic Park

Dr Paul Annett
Sport & Exercise Medicine Physician
Treatment - DPCS

- Failure of decompression
- Co-existant periostitis
- Tibialis posterior
- Fasciotomy vs. fasciectomy
- Scar formation
- Irreversible muscle damage
Treatment - CECS

COMPARTMENT SYNDROME AND FASCIO TOMIES OF THE LOWER LEG
Other Pathology

- Consider ALL vascular causes
- Popliteal Artery Entrapment Syndrome
- Compression below gastrocnemius
- Unilateral exertional calf pain
- Abnormal post-exercise pulse
Case History

- Excellent history / examination for anterior compartment syndrome
- CPT
  - Rest high 20’s
  - 1 min post exercise high 40’s
- Surgical decompression
- Excellent outcome with return to running unrestricted
Summary

• Lower leg pain is common in athletes
• Differentiation depends on careful history, examination and investigation
• Always consider compartment syndrome with ischaemic type lower leg pain
• Conservative treatment initially
• Prolonged symptoms may require surgical treatment
Thank You