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Exercise Induced Lower Leg Pain and Exertional Compartment Syndrome

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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!



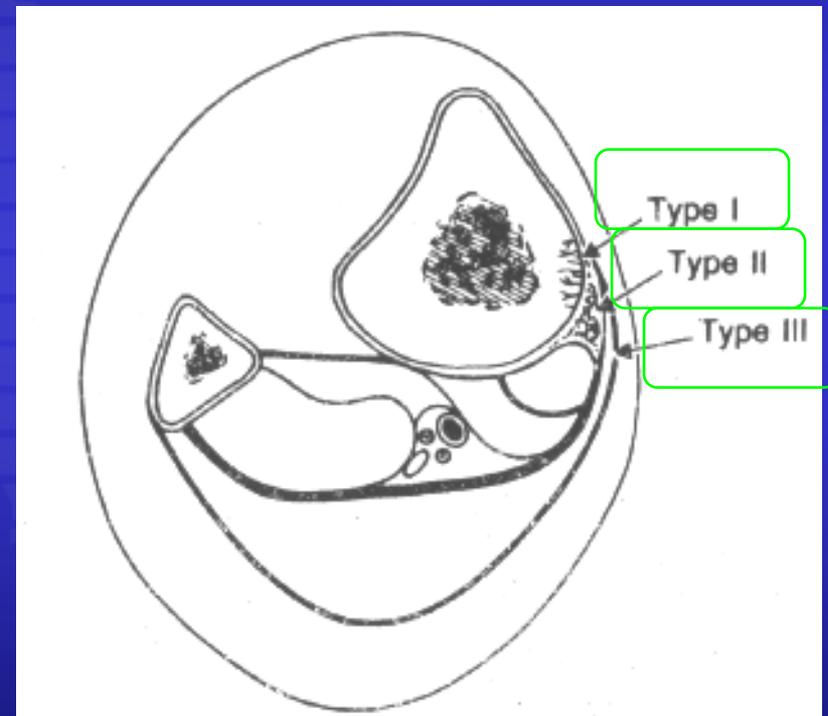
Case History

- 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



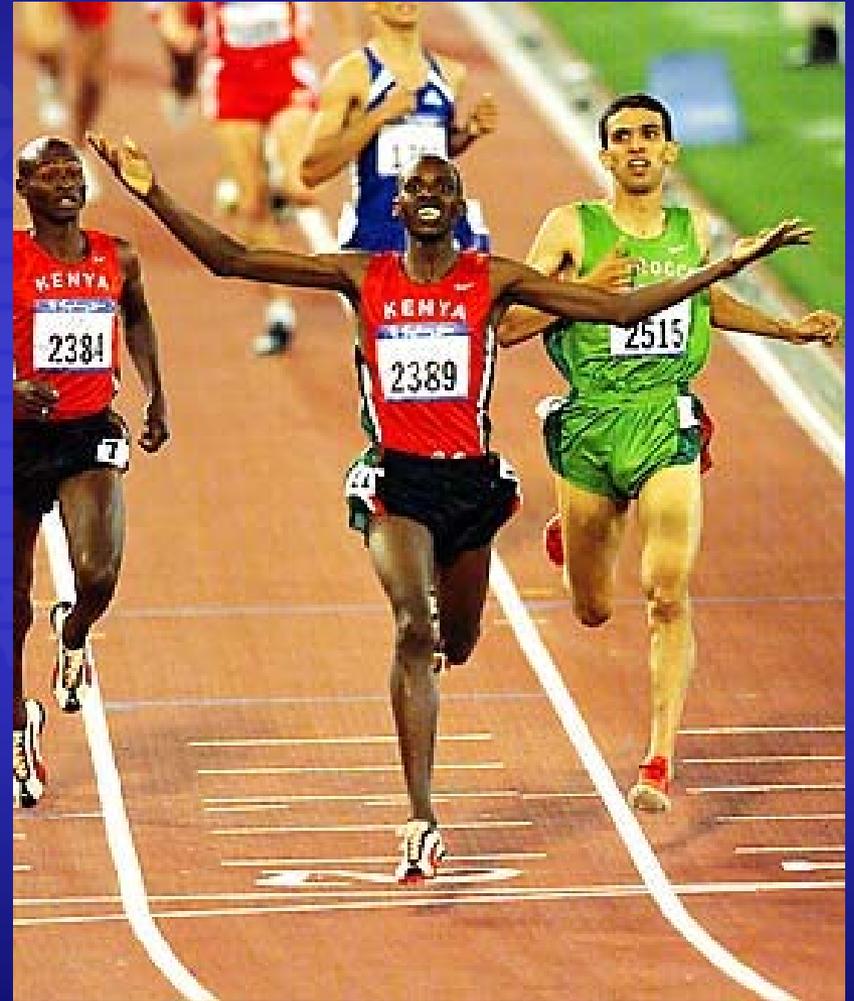
Stress Fracture

- 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



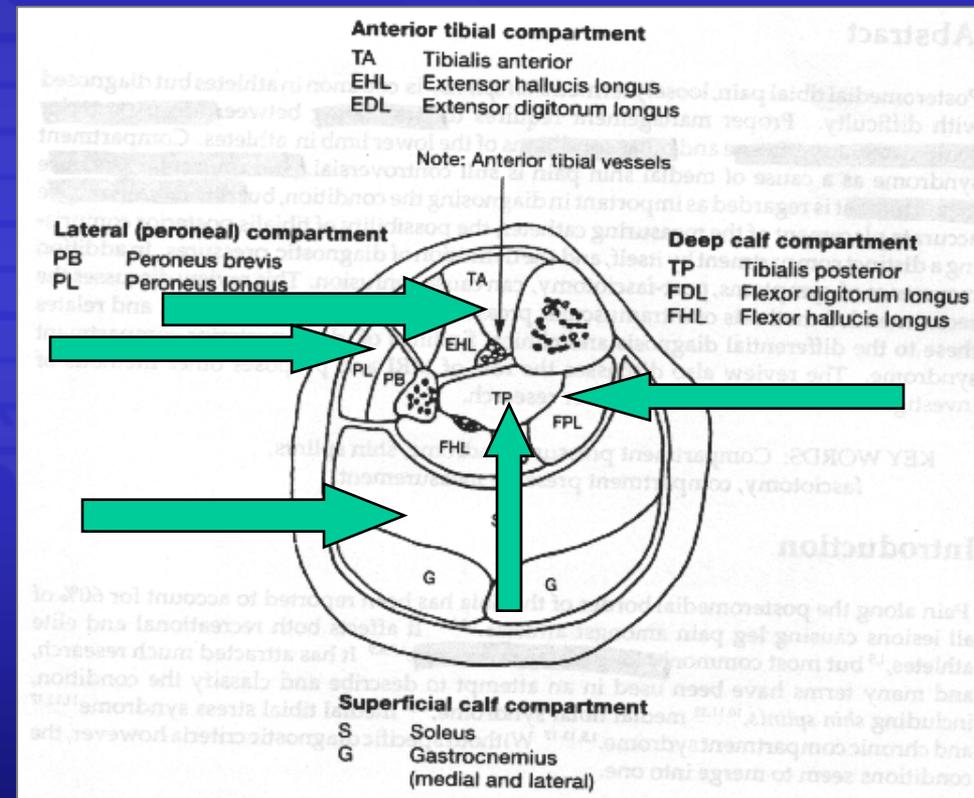
Chronic Exertional Compartment Syndrome

- ‘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



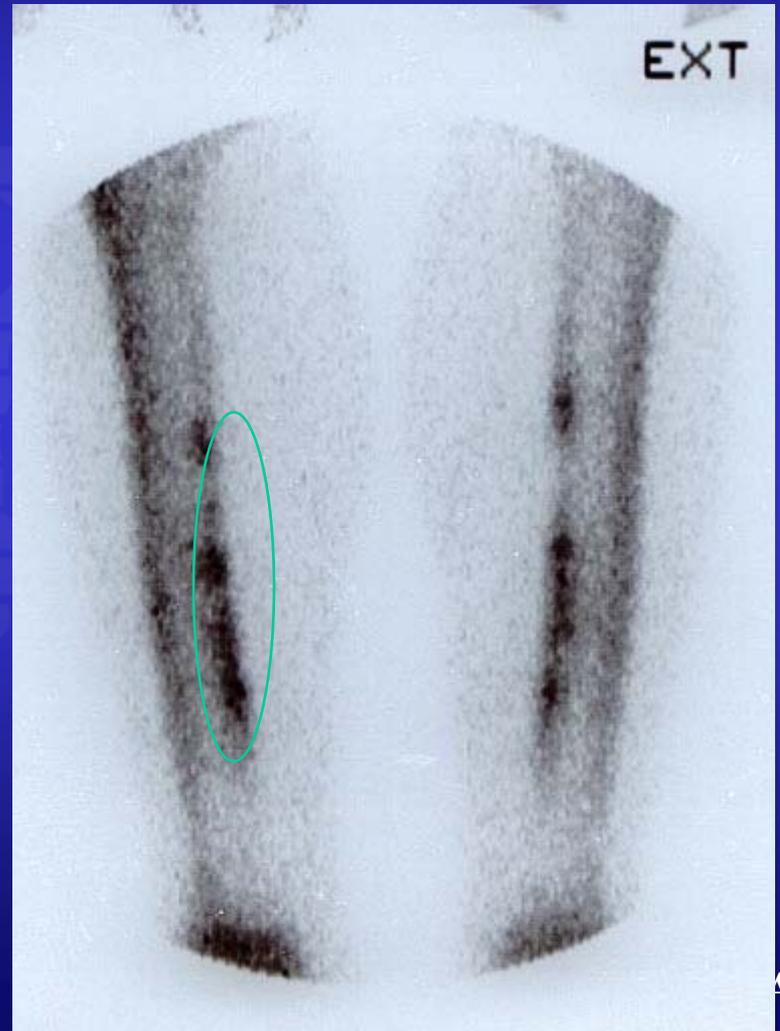
Chronic Exertional Compartment Syndrome

- 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



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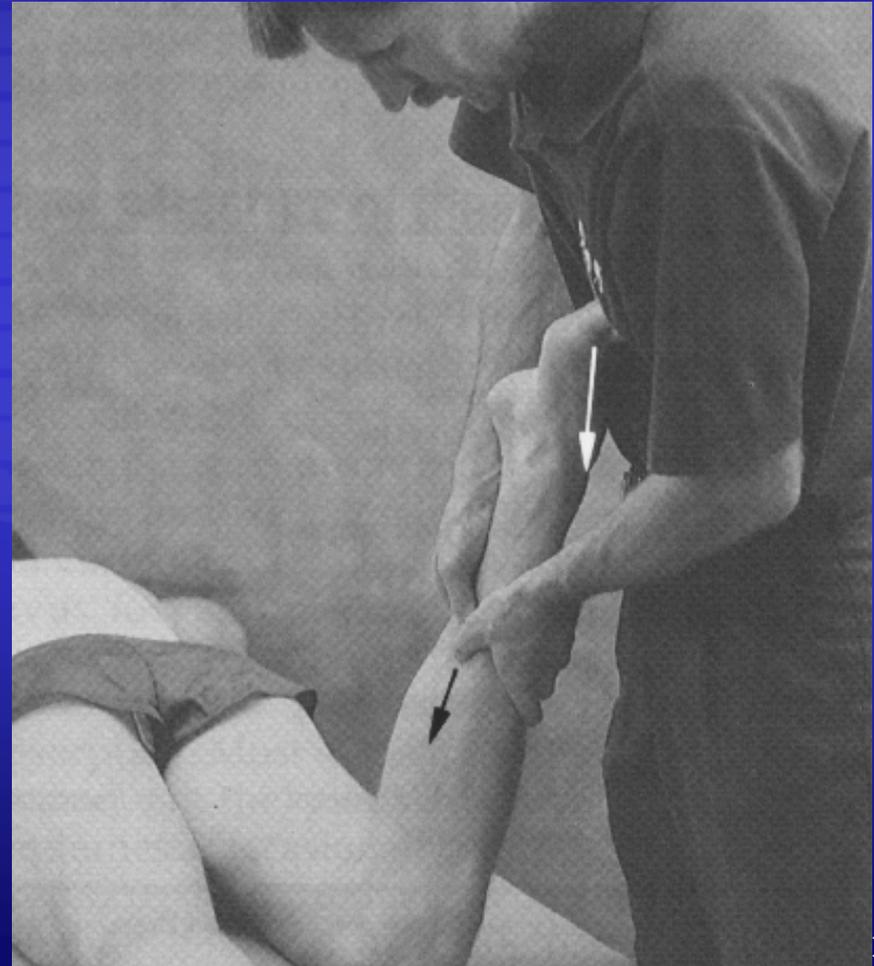
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Diagnostic Procedure



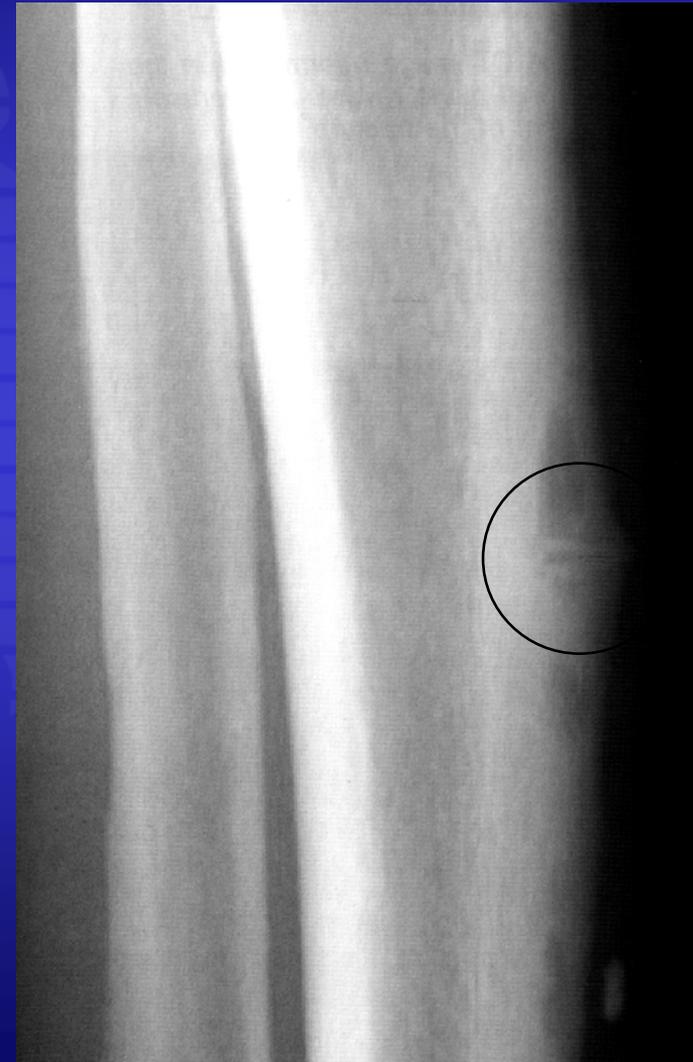
Treatment - Periostitis

- 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
 - (Schepesis '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
 - (Schepesis '93)
 - Consider Olympic Park

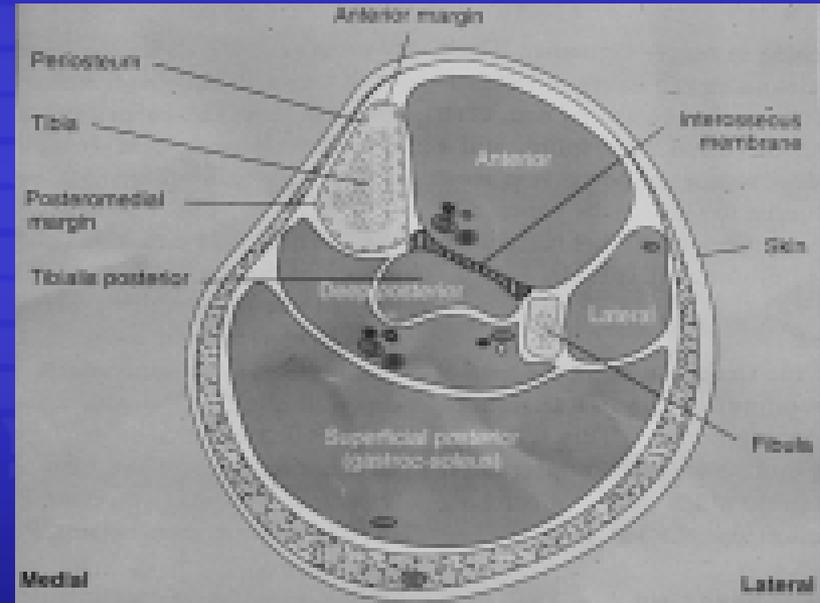


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Treatment - DPCS

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



Treatment - CECS

COMPARTMENT SYNDROME AND FASCIOTOMIES 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



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