NON-SURGICAL MANAGEMENT OF ACHILLES TENDINOPATHY

IMAGE GUIDED HIGH VOLUME INJECTION

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ACHILLES (*Homer 800BC*)

When Achilles’ mother Thetis made her son invulnerable by submerging him in the Styx, the river separating the living world from the underworld, she held the newborn baby by the tendon bundle running from the gastronomies & soleus muscles to the calcaneus.

As a consequence, this was the only site of the boy’s body that did not come into contact with the magic and protecting waters of the river and, it would be the tragic and inevitable fate of the great hero of the Trojan War.

He was eventually be killed by an arrow hitting him at that specific spot.
ACHILLES TENDINOPATHY

ACHILLES TENDON, TENDINOPATHY, TENDINOSIS, TENDINITIS
ANATOMY

Calf muscles

- Gastrocnemius
- Soleus
- Achilles tendon
BIOMECHANICS OF ACHILLES TENDON

- ACTIN & MYOSIN PRESENT IN TENOCYTES (Ippolito, 1980).
- STIFF & RESILIENT (Ker, 1981, Jozsa, 1997).
- HIGH TENSILE STRENGTH (Ker, 1981, Jozsa, 1997).
- STRETCH UPTO 4% BEFORE DAMAGE.
- MALES HIGHER MAXIMUM RUPTURE FORCE, STIFFNESS & CROSS SECTIONAL AREA (Thermann, 1995).
- YOUNGER TENDONS SIGNIFICANTLY HIGHER RUPTURE STRESS & LOWER STIFFNESS.
BIOMECHANICS OF ACHILLES TENDON
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PEAK LOAD ON ACHILLES TENDON

Running  9kN  (Corresponding to 12.5 times body weight)
Slow Walk  2.6kN
Cycling  <1kN

ACL requires forces up to 2kN to disrupt
Patellar tendon accepts up to 8kN.
EFFECTS OF EXERCISE

- Chronic loading in the form of physical training leads both to increased collagen turnover as well as to some degree of net collagen synthesis (*Kjaer 2006*).

- Initial effect may be damage that repairs (like DOMS).

- If loading excessive and repeated this “hyper-repair” may not take place.

- Degeneration may result.
AETIOLOGY OF ACHILLES TENDINOPATHY

- UNCLEAR
- OVERUSE STRESSES *(Clement, 1994., Fahlstrom, 2002)*
- INTRINSIC FACTORS: tendon vascularity, GS dysfunction, age, sex, body weight & height, pes cavus, excessive motion of hindfoot in the frontal plane (Whipping action of AT), forefoot varus, lateral ankle joint instability.
- EXTRINSIC FACTORS: change in training method, poor technique, previous injury, footwear, surface.
- LACK OF FLEXIBILITY
- GENETIC MAKE UP
- SEX
- METABOLIC FACTORS
KEY FEATURES OF ACHILLES TENDINOPATHY

- Histological studies show little or no inflammation in tendons

- Degeneration – loss of collagen structure, scarring, even cysts

- Presence of Neo-vascularisation

- Immobilisation does not work
MANAGEMENT
MANAGEMENT

More an art than science (*Khan & Maffulli, 1998*)

- Prevention – sensible training programme (*Stanish, 1984*)
- Early medical attention (*Lemm, 1992., Maffulli, 1999*)
- Modify activity (*Welsh, 1980*)
- Deep friction massage (*Cyriax, 1980*)
- Gentle static stretch (*Kvist, 1991*)
- Eccentric strengthening of gastrocnemius-soleus muscle (*Stanish, 1992., Curwin, 1986*)
- Control of symptoms – pain relief via Ice, NSAID’s, Analgesia, Therapeutic US, low dose heparin, corticosteroid (*DaCruz, 1996*)

- Surgery
**MANAGEMENT**

- Alfredson (1998) took 15 patients who had failed conventional treatment (inc. physiotherapy, stretching and injection)
  - Increased load progressively
  - Eccentric exercises – all 15 were back to original sport in 3 months
  - VAS Pain score down in all

  - Similar regime for Knee – 3 sets of 15 one leg semi-squats twice daily
  - 20 degree decline
  - 6 out of 8 back to sport by 12 weeks
MANAGEMENT

- Alfredson looked at Neo-vascularisation & eccentric stretch.
- Neo-vascularisation not present in normal tendons
- Knobloch et al (2006) increase in microcirculation in both insertional and mid portion tendinopathy
- No abnormal vessels in controls and asymptomatic side
NEO-VASCULARISATION

- Neo-vascularisation is abnormal
- Associated with nerves
- LA to vessels removes pain

- SO REMOVE VESSELS MAY IMPROVE SYMPTOMS.
INJECTION THERAPY

SCLEROSANT (Hoksund & Alfredson, 2004)
- 3 injections of Polidocanol placed under US control
- Initially increase in vessels
- Good results in 80%

AUTOLOGOUS BLOOD (Taylor, 2002., Connell, 2006)
- Injections into the abnormal degenerate tendon.
- Safe
- Repeated injections 2-3
- Good results in 70% initially
- Requires grossly abnormal tendon