Achilles tendinopathy and Intramuscular stimulation

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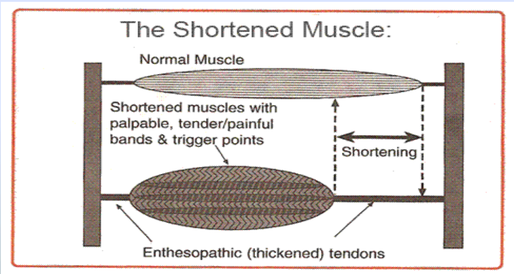
The cure for Achilles' heel?

A statue at the Achilleion Palace in Corfu that represents Achilles dying trying to remove the spear from his ankle.

The prevalence of Achilles tendinopathy (AT) is high and its impact on physical activity is significant, with up to 20% of patients experiencing pain and activity limitation after 5 years despite optimal management. Physiotherapists commonly treat AT with progressive rehabilitative exercise. A growing number of physiotherapists also use Intramuscular stimulation (IMS) to treat AT but its efficacy in treating this pathology has not yet been examined. We hypothesize that the participants in this study who receive IMS in addition to a progressive exercise programme will experience a greater reduction in their AT symptoms.



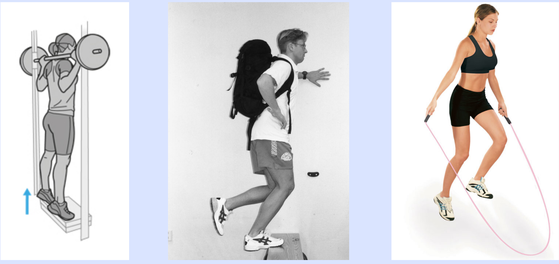
Gunn's model of the relationship between tendinopathy and shortened muscles[1].

Methods

This is a prospective, single blind, randomized controlled trial with three groups of AT subjects. All groups will receive a standard 12 week physiotherapy program provided by LS, including a standardized progressive exercise programme. The first (treatment) group will also receive IMS. The second (placebo) group will receive an equivalent number of sham (superficial non-intramuscular) needling sessions. The third (control) group will receive the progressive exercise programme alone.

The outcome measures are:
- VISA-A (a disease-specific outcome measure)
- Participant satisfaction
- Treatment success/failure (scores of very much improved or much improved will be categorized as successes)
- Ankle dorsiflexion range of motion/gastrocs-soleus muscle length measures

Ultrasound Tissue Characterisation scanning will be conducted to assess the integrity of the tendon tissue. Outcomes will be measured at 6 weeks, 12 weeks, 6 months and 1 year. Forty two participants will be enrolled. They will have at least a three month history of mid-portion Achilles tendon pain. They will not have had previous experience with acupuncture or IMS.

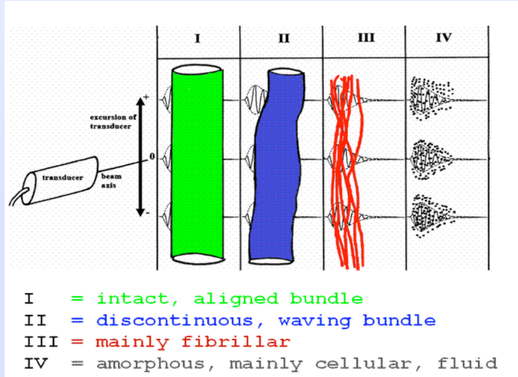


All groups will be prescribed a standardized progressive exercise programme

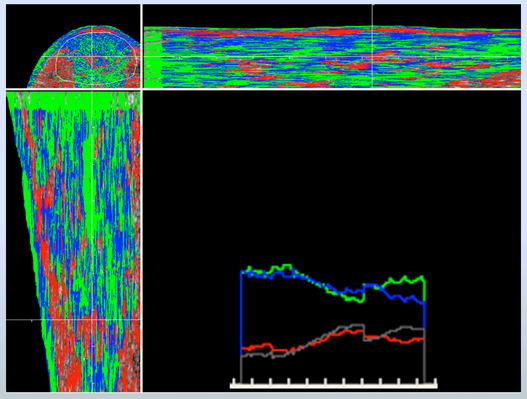
The technique of Intramuscular stimulation for the gastrocnemius muscle

Anticipated Results

We hypothesize that, compared to the placebo and control groups, the IMS treatment group will:
- experience a greater improvement in the VISA-A score
- contain a greater proportion of participants reporting satisfaction with treatment
- contain a greater proportion of participants reporting treatment success
- experience a greater improvement in ankle dorsiflexion range/gastrocs-soleus muscle length



Ultrasonographic Tissue Characterisation scanning determines tissue quality based on ultrasound echo-types[2].



UltrasonographicTissue Characterisation analysis of abnormal, tendinopathic, Achilles tendon[2].

Conclusions & future work

This study will be the first iSTOP-UBC collaborative study, and the first RCT examining the effect of IMS on AT. The vast majority of AT pathology is associated with tight muscle bands that are highly amenable to treatment with IMS. If successful, this study would be likely to stimulate further research by ourselves or other groups, e.g. examining the effects of IMS on other tendinopathies such as the lateral elbow. This proposal addresses a recognized gap between clinical experience and research evidence, and the results will thus be directly relevant and of potentially high impact to practising clinicians and their patients.

Should Ultrasound Tissue Characterisation scanning indicate an effect of IMS on tissue remodeling, it will likely stimulate research investigating the mechanisms of this effect.

References

1. Gunn CC. *The Gunn Approach to the Treatment of Chronic Pain: Intramuscular Stimulation for Myofascial Pain of Radiculopathic Origin, 2nd edn. Edinburgh, London, New York, etc.: Churchill Livingstone, 1989.*

2. van Schie HT, de Vos RJ, de Jonge S, et al. Ultrasonographic tissue characterisation of human Achilles tendons: quantification of tendon structure through a novel non-invasive approach. *Br J Sports Med*. 2010; 44(16):1153-9.

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Acknowledgements

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