

Tendinopathy = Disease of the Tendon

- Over/under loading of tendon leads to microscopic failure with attempted healing
- Continued inappropriate loading impairs the healing process
- Tendon develops areas of low collagen concentration, thickening, increased vascularity (+/- pain generating nerves?)

Basic Tendinopathy Approach:

- Stop aggravating activities:
 - o Minimise weight bearing/repetitive actions
 - o Use unaffected side eg mouse/work station
 - o Avoid prolonged rest – regular stretch/ROM actions
- Settle pain:
 - o Ice cup massage – 10-15 minutes 4 x daily + after activity – add Voltaren gel prior to ice
 - o Elevate
 - o Support – shoe; heel wedge; arch support OTC; orthotic; moonboot; brace;
 - o Analgesia +/- topical NSAIDs (wrap in glad wrap at night) +/- oral NSAIDs (not to be used in acute injury setting)
- Restore ROM:
 - o Flexibility
 - o Joint mobilisations
- **Add eccentric strengthening:**
 - o **ALFREDSON PROGRAMME** – 90-180 per day in several session
 - o Stimulates tenocyte production of collagen
 - o 60-100% improved at 12 weeks
- Add concentric/dynamic component:
 - o Gradually strengthen tendon mimicking desired action
- Add sport specific actions:
 - o Gradual increase in duration/intensity
- Physiotherapy:
 - o Soft tissue manual therapies/releases/needling
 - o Electrotherapies:
 - US & laser (enhance proliferative phase, collagen orientation)
 - TENS, interferential stimulation (maintain muscle function)

Adjunctive Treatments for Tendonopathy

Corticosteroid Injections

- Most commonly used injection therapy for tendinopathy
- Injected adjacent to tendon, usually deep surface, not in to tendon
- Mixed benefit:
 - o Short term reduction in pain – “window of opportunity”
 - o Inhibit cell activity – actually delay healing
 - o Risk of tendon rupture (very low in controlled situations)
 - o Other injection risks – infection, steroid flare, soft tissue atrophy
- **High volume injection under Ultra Sound guidance into layer between tendon covering and tendon “strips” neo-vessels and associated immature nerves:**
 - o Success in tenosynovitis with increased vascularity on USS
- Request Doppler USS to assess for neo-vessels

Practice points (indications and contraindications for the use of corticosteroid injection in soft-tissue lesions¹⁶)

Indications

- reserve for chronic injuries, after a failure of intensive use of other approaches for at least 2 months
- use when rehabilitation is inhibited by symptoms

Contraindications

- if pain relief and anti-inflammatory effects can be achieved by other methods
- local or systemic infection
- coagulopathy
- tendon tear
- local corticosteroid injections are often unnecessary and should be avoided in the younger patient.

Practice points (potential unwanted effects of local corticosteroid injections¹⁶)

- hypersensitivity—local or systemic
- tissue atrophy
- tendon rupture
- infection—local or systemic
- post injection ‘flare’ of symptoms
- osteonecrosis/steroid arthropathy (intra-articular injections, weight-bearing joints)

Other Injection Therapies

- **Autologous Blood and PRP Injections:**
 - o Theory of platelet derived growth factors released and stimulate tendon healing
 - o 2-3 injections every 2-4 weeks INTO tendon +/- adjacent to tendon (2ml blood products + 2ml lignocaine)
 - o +/- Fenestration – multiple penetrations with needle after local anaesthetic working
 - o Anecdotal evidence and case reports
 - o RCT found no difference compared with eccentric exercise
 - o Low risk – painful
- **Sclerotherapy:**
 - o Theory of obliterating the neo-vessels and their immature nerves (thought to be one of the pain generating structures in tendinopathy)
 - o Inject polidocanol into neovessels under direct US guidance
 - o Some supporting evidence
 - o Technically challenging
- **Prolotherapy:**
 - o Theory of stimulating collagen deposition via irritation/inflammation to surrounding tissues +/- obliterating the neovessels
 - o Commonly use hypertonic glucose/lignocaine mix
 - o Injected alongside tendon directly into tender area
 - o Weekly injections for 3-12 weeks
 - o Some evidence of early improvement with Prolo+Eccentric vs Eccentric alone in mid-portion Achilles tendinopathy – similar long term outcomes
 - o Low risk – painful
- **Actovegin:**
 - o De-proteinised calf blood
 - o Injected into tender areas
 - o Commonly used in Germany for muscle injuries
 - o No supporting high quality evidence
- **Traumeel:**
 - o Herbal/homeopathic solution with purported anti-inflammatory effects
 - o Often injected with Actovegin
 - o Low risk – well tolerated
- **Aprotinin:**
 - o Bovine derived protein that inhibits proteolytic enzymes
 - o Purported to increase tendon collagen content and thus strength via inhibiting collagenases
 - o Issues with anaphylaxis
 - o Withdrawn from market – used in research only

Topical Treatments

- **NITRIC OXIDE DONOR PATCHES:**
 - o Stimulate fibroblast/tenocyte proliferation and collagen formation
 - o Cause headaches in young
 - o Start 1/8th or ¼ patch directly over tender area per 24hrs
 - o Replace every 24hrs, vary position slightly to minimise risk of skin irritation
- **Extracorporeal shock wave therapy (ESWT):**
 - o Low energy pulses cause cavitation in tissues – thought to stimulate healing process
 - o Recent evidence for improvement in early outcomes when combined with traditional eccentric strengthening programme
 - o Pain limiting application – does improve over several sessions
 - o Not readily available
 - o Not ACC funded - \$200-300 per treatment
- **Iontophoresis:**
 - o Use NSAID/corticosteroid gel on pad applied directly over tender area
 - o Electrical current drives medication into tissues over 20 minutes
 - o Insertional tendinopathies – anecdotal reports of improvement
- **Balance and Power bands:**
 - o Really....
 - o Hologram channels and balances the body's "energy"
 - o Australian manufacturer ordered by court to repay all users who request a refund

Hyperbaric Oxygen

- Increases the partial pressure of oxygen in the blood
- Medical uses:
 - o Decompression sickness, gas emboli
 - o Carbon monoxide poisoning
 - o Problematic wound healing, eg diabetic foot, skin grafts, burns
 - o Acute compartment syndrome
 - o
- Evidence for stem cell activation via nitric oxide mediated pathway
- Animal evidence for increased collagen synthesis and tissue strength in proven tendinopathy
- Cost and access are limiting factors

Surgery

- Rarely performed now for pure tendinopathy
- Post-surgical rehabilitation protocols mimic tendinopathy treatments

References

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