Subcutaneous prolotherapy treatment of refractory knee, shoulder, and lateral elbow pain

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Subcutaneous prolotherapy treatment of refractory knee, shoulder, and lateral elbow pain

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Abstract

In 2005, 127 painful knees (74), shoulders (33) and lateral elbows (20) were treated with subcutaneous prolotherapy. The mean length of symptoms was 23.9 months and mean length of treatment 7 weeks. The mean initial visual analogue scale (VAS) of 6.7 reduced at mean follow up of 21.4 months to VAS 0.76. Patient satisfaction rates at follow up were 91.7%. The treatment was well tolerated and safe.

Introduction

The most common presentation in a prolotherapy clinic is chronic musculoskeletal pain with variable associated degrees of dysfunction. All patients presenting had refractory musculoskeletal pain despite prior multiple treatment modalities from a wide range of health professionals. They had been thoroughly investigated.

The author had already experienced excellent results from targeting tender/trigger points (TPs) with a hypertonic glucose/lignocaine solution in the subcutaneous tissues of Achilles tendinopathy.[1]

There is growing international appreciation that most knee, shoulder, and elbow pain is due to tendinopathy/tendinosis.[2]

It was hypothesized that the underlying pathology was similar to Achilles tendinopathy and that the expected response to subcutaneous prolotherapy would be comparable. As with the Achilles tendon pilot study, all patients were prospectively monitored with a Recovergram.[3]

The observed clinical outcome suggested a similar outcome as for Achilles tendons and it was decided to substantiate the results with long-term follow up evaluation.

Methods and results

All patients presenting in 2005 were prospectively monitored with a Recovergram.

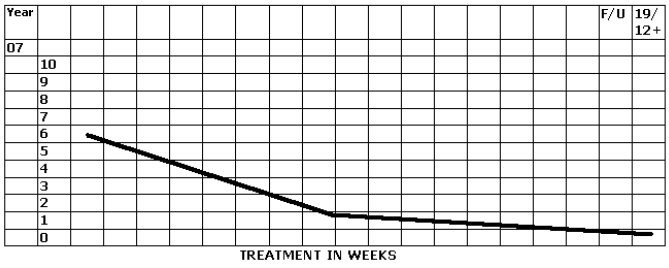
The treatment protocol consisted of weekly treatments where possible. All active TPs were identified by palpation and injected subcutaneously with 0.5-1 ml of a Glucose 20%/Lignocaine 0.1% solution. The objective at the time of each treatment was to achieve complete local anesthetic pain relief. Treatments were continued until VAS 0-1 and/or after consultation with the patient.

Patients were encouraged to assist the treatment by resuming some form of modified activity on a daily basis, emphasizing that a mild degree of pain during activity was beneficial to repair. Clinical experience had already identified that rest does not enhance response to subcutaneous prolotherapy. This advice is in line with Alfredson and Ohberg's[4] protocol for Achilles tendinosis eccentric strength exercises.

All individual Recovergrams were collated into a "Study Recovergram" with recordings of gender, mean age, mean length of symptoms, mean length of treatment, mean initial VAS, mean length of follow up, mean follow up VAS, and satisfaction rates.

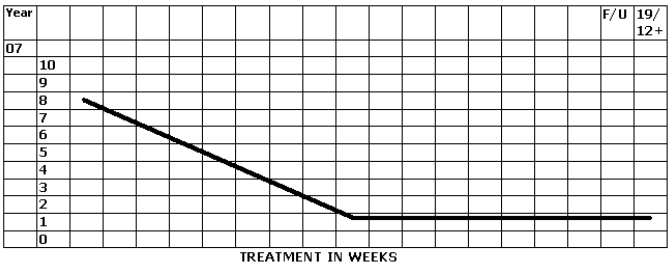
Follow up was conducted by telephone through an independent party.

STUDY RECOVERGRAM 2005 PERIPATELLAR PAIN (74 KNEES)
Glucose 20%/Lignocaine 0.1%
VAS: Visual Analogue Scale 0=no pain 10= worst imaginable pain



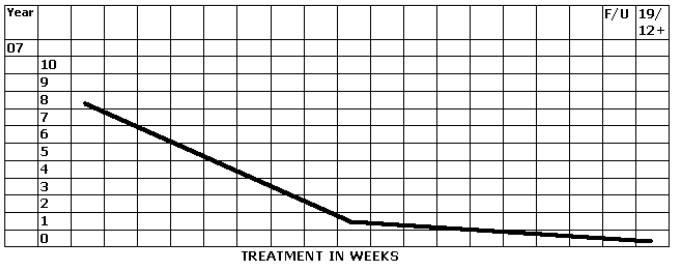
No of knees treated	74
Males	42
Females	21
Mean age	43 (15-82)
Mean length of symptoms	33.7 months (1-204)
Mean length of treatment	6.8 weeks (2-15)
Mean initial VAS	6.3 (3-9)
Follow up 73% at mean 21 months	
Mean follow up VAS	0.84
Satisfied with treatment	89%

STUDY RECOVERGRAM 2005 SHOULDER
Glucose 20%/ Lignocaine 0.1%
VAS: Visual Analogue Scale 0=no pain 10= worst imaginable pain



No of shoulders treated	33
Males	15
Females	18
Mean age	51.3 (19-81)
Mean length of symptoms	12.9 months (1-120)
Mean length of treatment	7.6 weeks (2-14)
Mean initial VAS	7.4 (5-9)
Follow up 75% at mean 24 months	
Mean follow up VAS	1.8
Satisfied with treatment	88%

STUDY RECOVERGRAM 2005 LATERAL ELBOW PAIN
Glucose 20%/Lignocaine 0,1%
VAS: Visual Analogue Scale 0=no pain 10= worst imaginable pain



No of elbows treated	20
Males	11
Females	9
Mean age	39 (24-64)
Mean length of symptoms	6 (2-18)
Mean length of treatment	7.2 weeks (3-16)
Mean initial VAS	7.2
Follow up 77% at mean 19 months	
Mean follow up VAS	0.4
Satisfied with treatment	100%

Discussion

The author's clinical experience that response rates to subcutaneous prolotherapy for refractive musculoskeletal pain are consistent irrespective of location is worthy of closer scrutiny.

This clinical study attempts to quantify the treatment outcome of refractory knee, shoulder and lateral elbow pain with respect to duration of treatment and duration of effect. The results are not dissimilar to four years of subcutaneous treatment of 169 Achilles tendinopathies as separately reported in this journal.

The combined outcome statistics for the treatment of the 2005 knee, shoulder and lateral elbow pain showed a mean length of symptoms of 23.9 months and a mean treatment length of 7 weeks. The mean initial VAS 6.7 reduced at follow up of mean 21.4 months to VAS 0.76. The combined satisfaction rate at follow up was 91.7%.

These statistics suggest a treatment effect with lasting benefits.

In a clinical study of this kind it is important to consider the effect of subcutaneous prolotherapy on individual patients as statistics cannot do this. Of the 33 patients with shoulder pain three (12%) did not respond and opted for surgery. 64% were completely pain free from the end of treatment to follow up. The remaining 23% had a marked reduction of pain at the end of treatment, which was sustained, resulting in an overall satisfaction rate of 88%.

One 53-year-old female patient, the owner of a vineyard, had two years of severe pain (VAS 9, including night pain). She had prior treatment with two corticosteroid injections and extensive physiotherapy. She required 14 weeks of treatment to achieve VAS 0, the same at follow up. She described the result at telephone follow up as "fantastic".

At her first consultation large numbers of very active TPs were identified over the left infraspinatus. Mechanical stimulation of these TPs increased her associated hand pain, previously diagnosed as carpal tunnel syndrome. Numerous TPs were also identified in the mid and anterior deltoid. The hand pain resolved with one treatment and the night pain with two. She had full asymptomatic range of movement (ROM) and normal strength at the end of the treatment. An ultrasound (US) examination before the treatment did not identify rotator cuff pathology, although clinical examination showed a clear painful arc and markedly reduced ROM.

The above statistics, although impressive, are unhelpful in outlining the specifics of subcutaneous prolotherapy when treating these incapacitating painful conditions as each patient has a different pain pattern and a different distribution of TPs. This is where the skill and "art" in medicine define outcome.

In the traditional rationale for prolotherapy an irritant solution (proliferant) is injected in or around painful weak ligaments and/or entheses, creating an inflammatory response. This inflammation is said to initiate a repair response resulting in strengthening of the weakened ligament and resolution of pain.[5]

The understanding of tissue repair has changed since Hackett first published his theories on prolotherapy in 1956. Inflammation is now seen as a cellular mechanism to render the tissues immunologically neutral and "effective repair" is determined by the balance between proliferation and apoptosis.[6,7] The role of the peripheral nervous system in initiating tendon repair and renewal in a rat model of Achilles tendon injury has been identified by Ackerman et al.[8] The importance of the peptidergic "noceffectors" calcitonin gene-related peptide (CGRP) and substance P (SP) in repair was first described by Kruger et al. in 1989,[9] and a review in the *British Journal of Pharmacology* in 2003[10] focussed on the evidence that nerves and blood vessels control each other in a paracrine way. The new role of vascular endothelial growth factor (VEGF) as a neurotrophic factor as well as an angiogenic factor is discussed in "Vascular endothelial growth factor and the nervous system"[11] and research is now identifying CGRP nerves as controlling tissue VEGF levels at least in psoriasis.[12] VEGF levels are elevated in tendinosis,[13] and in oncology research it is well established that VEGF prevents apoptosis

and normal cell senescence, allowing proliferation of nociceptors and endothelial cells to proceed unhindered.

Inflammation increases pain and this does not fit in with the clinical experience in subcutaneous prolotherapy of an immediate reduction in pain often after the first treatment, and in particular night pain seems to diminish early.

The author hypothesizes that subcutaneous prolotherapy injections of hypertonic glucose and 0.1% lignocaine induce apoptosis of proliferating peptidergic noceffectors and neovessels by reducing VEGF levels and restoring "effective repair" processes, with reduction of pain.

Whatever the rationale is going to be for subcutaneous prolotherapy, the reported initial results are encouraging, particularly as one considers the proven safety, speed of response, the low cost, and the lasting benefit of this treatment.

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