Acupuncture Point Injection in the Treatment of Midportion Achilles Tendinopathy: A Case Report

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ABSTRACT

Midportion Achilles tendinopathy is a chronic, painful condition sometimes referred to as Achilles tendinosis or more controversially Achilles tendinitis. Considered to be one of the most common overuse injuries in participants of recreational and competitive sport, it is by no means restricted to athletes. This case presentation features the treatment of midportion Achilles tendinopathy and underlying lower-back pathology in a 46-year-old recreational runner with acupuncture and acupuncture point saline injection, following unsuccessful conventional biomedical treatment. Acupuncture was used during treatment; however, the primary intervention was the injection of saline solution BP into acupuncture points. Injection of acupuncture points is a common therapeutic technique in China. In Australia, acupuncture point injection is more commonly performed by naturopaths or homoeopaths injecting saline. The case described offers practitioners another approach using a technique which has a long history of use in Chinese medicine. The discussion also identifies that the use of saline injection is not well documented in biomedical literature and should be further investigated in prospective randomised controlled trials.

KEYWORDS Tendinopathy, tendinitis, Achilles, midportion, acupuncture, injection, Saline, Alfredson's, Gillet, VISA-A.

Introduction

Achilles tendinopathy occurs in all sections of the population, but runners are at 30 times greater risk than those who are sedentary.[1] Between 2 and 16% of those affected are forced to abandon their physical activity and in some settings 20–30% of patients will require surgery.[2] Despite these figures, the exact incidence of Achilles tendinopathy is unknown. This case report specifically involves midportion Achilles tendinopathy. It is important to differentiate between midportion and insertional Achilles tendinopathy as their treatment and prognosis differ. Midportion Achilles tendinopathy refers specifically to the painful area of the Achilles tendon located 2–3 cm proximal to the tendon insertion.[1]

Midportion Achilles tendinopathy classically presents as fusiform swelling over the midportion of the tendon that is stiff and sore upon rising but improves with walking. The associated pain is often improved with activity or the application of heat, but tends to return with rest.[3] Classic presentations aside, the symptoms of midportion Achilles tendinopathy can vary greatly between patients. Onset may be

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sudden, gradual or insidious. Pain and touch tenderness may be minor, causing minimal disability, but can also be severe and debilitating. Swelling and nodulous lumps may or may not be present and will vary in size from one patient to the next. Symptoms can last just days or many years. The use of imaging to diagnose midportion Achilles tendinopathy is unreliable due to variations in findings from one patient to the next.[1]

There have been several theories as to the pathology of tendinopathy, leading to the differing terms used, including tenopathy, partial rupture, paratenonitis, tendovaginitis, peritendinitis and achillodynia.[4] Tendonitis, suggesting inflammation of the tendon, has long been a popular term, but histological studies of chronic tendonopathies have demonstrated that the expected inflammatory cells are usually absent or in very low numbers. Although tendinosis is often used, implying a degenerative condition without inflammation, tendinopathy is the more appropriate term as it does not attempt to define an underlying pathological process.[4,5]

There is much conjecture as to the cause of midportion Achilles tendinopathy. The mechanical theory suggests that continual loading of the tendon within normal parameters causes fatigue and eventually failure of the tendon structure. The vascular theory states that a compromise to the blood supply may cause degeneration of the tendon. One study by Mafulli et al. has found an association between radiculopathy and Achilles tendinopathy.[5] Exercise-induced hyperthermia has also been implicated in Achilles tendon cell degeneration causing tendinopathy.[4] Most recently, iceberg theory has been put forward, whereby, it is suggested, inflammation and degeneration combine in a type of pathogenic cascade.[6] The exact mechanisms leading to midpoint Achilles tendinopathy are unclear.

The treatments provided for midportion Achilles tendinopathy are even more diverse than the theories of its aetiology. They include cryotherapy, NSAIDs, eccentric training, topical glycerol trinitrate patches, therapeutic ultrasound, therapeutic laser, manual therapies such as deep tissue massage, heel pads or orthotics and surgical debridement. Several substances can also be injected to treat midportion Achilles tendinopathy including corticosteroids, heparin, dextrose, calcium gluconate, autologous blood and aprotinin.[1,5,7]

Because the symptoms of midportion Achilles tendinopathy vary from one individual to the next, TCM diagnoses also vary. The most common clinical presentation is likely to resemble Bi syndrome, also known as Painful Obstruction Syndrome.[8] As Bi syndrome is an affliction of the channels, pain is caused by an obstruction to the flow of qi and blood in the channels.[9]

Case History

A forty-six year-old female presents with a four-month history of Achilles tendon pain affecting her right side. The onset was gradual and was first noticed after completing her morning run. The pain worsened until she was no longer able to complete her usual running and cycling program. An ultrasound was undertaken and no significant abnormality was detected. She had no history of injury but had suffered periodic lower-back pain over a two-year period. Seeking treatment for the Achilles pain, she had tried orthotics from a podiatrist to restrict pronation and correct gait, local soft tissue manipulation, eccentric exercise in the form of Alfredson's heel-drop protocol from a physiotherapist, and glyceryl trinitrate (GTN) patches from a sports physician. The Achilles pain had now become so severe it was waking her at night and was causing her to hobble upon rising. Dissatisfied with these approaches and desperate to return to training she decided to try acupuncture.

Upon examination, the right Achilles was visibly swollen and tender to touch. Palpation revealed small tender nodule-like lumps that could be felt either side of the Achilles tendon midportion. There were no signs of visible redness and the area was neither hot nor cold to touch when compared to the unaffected Achilles tendon. There was palpable hypertonicity through the left lumbar muscles, positive Gillet test[10] for the right sacroiliac joint and touch tenderness deep on the right side in the region of BL 24 *Qihaishu* and BL 25 *Dachangshu*.

TCM Diagnosis

- Damp Bi with phlegm accumulation in the bladder and kidney channels surrounding Achilles tendon.
- Stagnation of qi and blood in the bladder channels of the lower back.

Biomedical Diagnosis

- Right sided midportion Achilles tendinopathy.
- Right sacroiliac joint dysfunction and pelvic torsion.

TCM Treatment Principle

Relieve pain, disperse phlegm damp and promote the flow of qi in the channels of the affected areas.

Treatment

Soft Tissue Manipulation: Soft tissue manipulation was performed on the lower back, psoas and external hip rotation muscles to correct the pelvic torsion. Sports massage was applied to the right calf.

Acupuncture Point Injection: Injections were performed using a 1 ml syringe fitted with a sterile single-use needle measuring 0.33 mm in diameter and 13 mm in length. A 1 ml dose of saline solution BP was injected into each point located posterior to KI 3 *Taixi* and posterior BL 60 *Kunlun* on the right leg at a depth of approximately 10 mm. Both points were located anterior to the border of the Achilles tendon and the needle was inserted in a superior and oblique direction. In a similar manner a 0.5 ml dose of saline solution BP was also injected into SP 6 *Sanyinjiao* and GB 39 *Xuanzhong*.

Acupuncture Needles: Vinco sterile single-use acupuncture needles were used on all points. Two acupuncture needles measuring 40 mm in length and 0.22 mm in diameter were inserted perpendicularly to a depth of approximately 25 mm into BL 25 *Dachangshu* bilaterally. Two acupuncture needles measuring 50 mm in length and 0.22 mm in diameter were inserted laterally and obliquely to a depth of approximately 40 mm into the two most tender Ahshi points on the right sacroiliac joint. One acupuncture needle measuring 25 mm in length and 0.20 mm in diameter was inserted superficially into GB 34 *Yanglingquan*. All acupuncture needles were retained for a period of fifteen minutes. There was no attempt to obtain *deqi* and no additional needle manipulation was performed.

The patient was instructed to continue the Alfredson's heel-drop exercise and stretch the right gastrocnemius and soleous muscles twice a day, holding the stretch for a period of ten breaths. She was also instructed to take 1800 mg of ecosopanthenoic acid in the form of omega-3 daily for the duration of the treatment, take 200mg of ibuprofen at a rate of two tablets every four to six hours with a maximum of six tablets per twenty-four hours for three days, and apply Traumeel cream to the Achilles area twice daily. The treatment plan was for the patient to return on a weekly basis until the symptoms were resolved.

The patient returned for her second treatment nine days later and reported decreased pain upon waking and she did not hobble so badly when taking the first steps out of bed. Because this treatment was with a different practitioner, acupuncture was used as the primary intervention. Returning to the author for her third treatment five days later, the patient stated she had not responded well to the previous treatment and felt there was no improvement. The initial treatment was repeated with the points SP 6 *Sanyinjiao* and GB 39 *Xuanzhong* omitted from injection. The patient was instructed to stop the Alfredson's heel drop exercise. This treatment was repeated at weekly intervals for two more weeks. At the end of two weeks the patient had no pain and the swelling in the Achilles tendon had all but gone.

A follow-up telephone conversation three months after the last treatment revealed the patient felt so good she decided further treatment was no longer required and had returned to training pain free.

Literature Review

A PubMed search was conducted using the following MESH terms: ('Tendinopathy' AND 'Achilles Tendon') AND ('Injections, Subcutaneous' OR 'Injections, Intramuscular' OR 'Injections, Intradermal'). This search yielded five results with no full-text articles available.

A broader search using the Ebscohost database was conducted in the hope of gathering more scholarly information on the topic. The search terms 'tendinopathy' AND 'Achilles' AND 'injection' were used, yielding 32 results, including 14 full-text articles. These full-text articles were then reviewed for relevance to the case at hand.

Discussion

This case demonstrates the incorporation of acupuncture point injection therapy in the treatment of midportion Achilles tendinopathy. Four months of conventional treatment failed to make any difference to this patient's midportion Achilles tendinopathy. After five treatments over a period of 28 days, using paratendinous saline solution BP injection as the primary intervention, the patient was pain free and able to return to training. The outcome of this case demonstrates the safe and effective use of acupuncture point injection in treating midportion Achilles tendinopathy.

Ibuprofen was recommended to minimise the possibility of inflammatory response from the initial treatment. As it was only taken for three days, we do not consider it to have had a significant influence on the outcome of the case. The intention of prescribing Traumeel and an omega-3 supplement was to reduce the effect of any inflammation occurring at the Achilles tendon. As midportion Achilles tendinopathy is thought to have little or no inflammatory component their effect on the outcome of this case is likely to be minimal.

Acupuncture point injection is a relatively new technique in acupuncture, with the earliest clinical reporting published in 1960. Injectants used include glucose solution, distilled water, vitamin, liquid extract from herbs, magnesium sulfate, procaine hydrochloride or saline.[11] There are also a number of acupuncture texts which contain reference to its use.[12] An internet search for practitioners reveals that the vast majority of those practising acupuncture point injection are naturopaths or homoeopaths. Perhaps this is because, until recently, the only training for acupuncture point injection in Australia was

focused on the use of saline injections in conjunction with oral homoeopathic solution.

Searching the literature confirmed that the use of saline injection is not well documented in current biomedical literature. The commonly studied injectants used for Achilles tendinopathy are corticosteroids, low-dose heparin, polidocanol and lidocane.[4,7,13,14]

Corticosteroid use is controversial due to the current understanding that chronic tendinopathy is a degenerative condition rather than an inflammatory one.[7] It is noted in many of the latest reviews that inflammation may play a role early in the pathogenesis of tendinopathy, and that inflammation and degeneration are not necessarily mutually exclusive.[6,7,13] However, even though corticosteroid use may seem to only be appropriate in the early phases of tendinopathy, it is apparent that NSAIDs do relieve pain and may be effective in short-term pain management.[4] The patient in this case had asked her sports physician about the possibility of receiving corticosteroid injections for her Achilles pain. The sports physician refused citing that corticosteroid injection may cause the tendon to rupture. This may be due to several reports of tendon rupture after corticosteroid injection in the area surrounding the Achilles. However, it appears the risk of rupture may be minimised if the corticosteroid is delivered by paratendinous injection.[7] Intratendinous injection poses potential dangers of tendon rupture[4] and is classified as a contraindication.

In a recent systematic review on point injection for musculoskeletal pain, the efficacy of eight injectants was compared: sterile water, lidocane, botulinum toxin, bupivacane, prilocane, dry needling, tropisetron, and saline. Even though saline was primarily used as a placebo control in most trials, the review reported improvements in all conditions treated regardless of the injectant used.[15] These results open the possibility that another mechanism may be involved in the relief of pain aside from the injectant's intended specific chemical interaction. Noxious stimulation of nociceptors and mechanoreceptors due to needling, the same processes involved in acupuncture, are no doubt in effect. Strudwick, Hinks and Choy found that the delivery of saline point injection at LI 4 *Hegu* delivered similar physiological responses to traditional acupuncture needling and that point injection recipients reported a greater subjective deqi response.[12] It is possible that point injection stimulation creates a strong healing response in the body, due to (a) greater needle width, (b) the formation of a fluid bolus that continues to provide stimulation to the tissue for a time after the needle is removed, and (c) local tissue interaction with the injectant. Saline, being pH neutral, may have its own particular effects on the acid-base balance of local connective tissues, and possibly optimising conditions for the body's self-healing mechanisms.

Studies have shown that eccentric strengthening programs can be effective in treating Achilles tendinopathy.[7] Although this patient did not respond to the Alfredson's heel-drop exercise program, the author has used it previously and found it to be a simple and effective tool for clinical use that should always be considered for inclusion in treatment of midpoint Achilles tendon pain.

Although not used in this case, the Victorian Institute of Sport Assessment–Achilles (VISA-A) questionnaire is a valid and reliable tool to monitor the severity of Achilles tendinopathy. It is not a diagnostic tool, nor does it indicate prognosis, but it can easily be completed by the patient in less than five minutes, providing the practitioner with a more objective tool to monitor the progress of treatment.[2]

Clinical Commentary

Achilles tendinopathy occurs in all sections of the population but runners are at 30 times greater risk than those who are sedentary. Between 2 and 16% of those affected are forced to abandon their physical activity and in some settings 20–30% of patients will require surgery. This case presentation features the successful treatment of midportion Achilles tendinopathy in a 46-year-old recreational runner with acupuncture and acupuncture point saline injection, following unsuccessful conventional biomedical treatment. Point injection therapy has been a part of acupuncture practice in China for over 50 years, but is not widely used in Australia.

Conclusion

Acupuncturists in China have used point injection as a treatment option for many conditions over the last 50 years. Acupuncture point injection seems to be an appropriate therapy if used by suitably trained acupuncturists in Australia. Given the history and apparent effectiveness of acupuncture point injection, it seems unusual that so few acupuncturists in Australia are using it, although a shortage of appropriate training opportunities may contribute to its slow uptake in the profession.

In our research we were unable to find any record of adverse reactions for paratendinous injection of saline. Current literature suggests that point injection may well share many therapeutic mechanisms with acupuncture therapy. In addition, prolonged or enhanced noxious stimulation and local tissue interaction with the saline injectant may also contribute to the effect of point injection therapy. Point injection for musculoskeletal pain can be effective regardless of the injectant used. As one of the cheapest and safest injectants, it seems reasonable to

consider normal saline point injection as a useful adjunct in clinical acupuncture practice, particularly in the treatment of midportion Achilles tendinopathy.

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