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CASE REPORTS

Left elbow lateral epicondylalgia, treated successfully with acupuncture combined with typical physiotherapy intervention

Justin Walsh
Crystal Palace Physio Group, London, UK

Abstract

This case study documents the use of acupuncture in addition to typical physiotherapy modalities in the management of a 41-year-old manual worker with lateral epicondylalgia (tennis elbow). The patient responded well to the intervention, with subjective improvements on functional scales, as well as objective improvements in pain-free grip strength. Acupuncture appeared to provide a worthwhile reduction in pain within at least the short- to medium-terms, although the true effect of acupuncture cannot be fully understood from this case study as other modalities were also used. Nevertheless, the case presents a comprehensive description of the successful management of a patient with lateral epicondylalgia where acupuncture was effectively included and was likely to have played a positive role.

Keywords: acupuncture, lateral epicondylalgia, physiotherapy, tennis elbow.

Introduction

Lateral epicondylalgia is a musculoskeletal condition affecting the lateral elbow, most commonly due to mechanical overload of the relevant tissues. The pathophysiology of the condition is characterized by tendinopathy at the common extensor origin, where the tendons of the forearm extensors are affected, in particular the extensor carpi radialis brevis tendon. Fibre necrosis, abnormal blood vessel infiltration and matrix substance infiltration stimulate peritendinous nociceptors, resulting in pain (Khan & Cook 2000).

Numerous treatments have been described in the literature for lateral epicondylalgia, including rest, nonsteroidal anti-inflammatory drugs (NSAIDs) (Green *et al.* 2001), corticosteroid injections (Coombes *et al.* 2010), strengthening exercises (Tyler *et al.* 2010), forearm bracing (Calfee *et al.* 2008) and mobilization with movement techniques (Vicenzino *et al.* 2007).

A systematic review (Trinh *et. al.* 2004) has described acupuncture as an effective modality for the short-term relief of lateral epicondylalgia pain. The relief of pain in the short term is an important consideration in the treatment of lateral epicondylalgia, as it is likely to assist in the patient's compliance to physiotherapy appointments and home exercise programmes. This can assist the therapist to introduce and progress an appropriate tendon loading programme, which is considered the mainstay of treatment for long-term relief of any tendinopathy (Cook & Purdam 2009).

There are numerous studies demonstrating this pain relieving effect of acupuncture in lateral epicondylalgia. Fink *et al.* (2002) compared acupuncture to sham acupuncture (5 cm away from true acupuncture points and avoiding Ah Shi and trigger points). They demonstrated greater reductions in pain within the acupuncture group at 2 weeks, with both groups demonstrating pain reductions that were not

Correspondence: Justin Walsh, Crystal Palace Physio Group, Jubilee Stand, Crystal Palace Park, London SE19 2BB, UK (j.walsh@cppg.co.uk).

statistically significant by 2 months. This study demonstrates the potential value of acupuncture in the early treatment phase, when the therapist is trying to establish "buy-in" from the patient to establish trust in the treatment pathway and compliance with the exercise programme. In regard to pain reductions in the medium term, although this study demonstrated equal pain reductions between groups at 2 months, the pain reduction in both groups were clinically significant. This is a relevant consideration for the therapist deciding whether to use acupuncture or not with their patient, as sham acupuncture will still have many of the positive physiological effects of real acupuncture. In other musculoskeletal conditions, it has been shown that compared to more inert placebo interventions, sham acupuncture has a greater pain-relieving effect (Ezzo *et al.* 2000).

In addition to the above randomized controlled trial (RCT), a systematic review by Trinh (2004) included six studies and concluded that "*acupuncture was effective in the short-term relief of lateral epicondyle pain*". Furthermore, a meta-analysis by Bisset *et al.* (2005) showed that acupuncture seems to have a positive effect for at least 2–8 weeks.

In summary, the available evidence suggests that acupuncture can provide effective lateral elbow pain relief in (at least) the short term. Thus it is indicated as an adjunct to traditional physiotherapy management, in particular a structured tendon loading programme, and is likely to play an important role in a patient's overall treatment pathway.

Description of the case

The patient was a 41-year-old left-handed male who worked as a full-time elevator engineer. The patient lived with his wife and two adolescent children. The patient reported a 4-month history of insidious onset left lateral elbow pain, which the patient associated with a period of increased lifting at work as he removed and installed elevator counterweights. The patient made the condition known to his relevant work supervisor at the time of onset but did not seek treatment immediately as he had completed the job that required the increased lifting, and

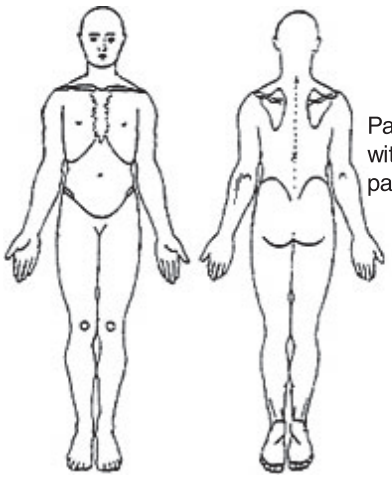

Figure 1. Pain map

therefore thought that the pain would reduce by itself. After 3 months of reduced lifting, the patient reported no improvement in symptoms and sought treatment via his private medical insurance, which was linked to his contract of employment. He had a phone conversation with a representative of the insurance company and was referred for physiotherapy without any further investigations. He presented for his initial physiotherapy appointment at 4 months post-onset of symptoms.

The patient reported a mild to moderate constant dull ache (Fig 1.), which changed in severity depending on preceding physical activity, as well as sharp pain when gripping objects or shaking hands. The patient reported that the sharp pain was worst when gripping and lifting objects in wrist pronation and elbow extension. The patient reported some mild night pain, which was usually not severe enough to affect sleep, as well as some morning elbow stiffness that lasted only for the initial few joint movements.

Past medical history included childhood asthma and Achilles tendinopathy 5 years ago, which resolved with rest and time. The patient denied any red flags for inflammatory pathology, infection or neurological conditions. The patient also denied any history of neck pain, wrist/hand pain or previous elbow pain on either side.

Physical examination revealed full range of motion of the hand, wrist, elbow, shoulder and cervical spine. Cervical quadrants and Spurling's were negative. The patient had pain on palpation

of the left lateral epicondyle and proximal 2 cm of the extensor tendons. Both stretching as well as loading of the extensor tendons reproduced the patient's symptoms. Pain-free grip strength (PFGS) (grip strength to the first onset of pain) with the elbow flexed to 90º and the forearm in mid-prone was measured at 4.5 kg vs 48.2 kg for the left and right respectively. With the elbow extended and the forearm pronated, pain-free grip strength was 1.4 kg vs 51.2 kg for the left and right respectively. The patient had mild reproduction of pain on upper limb neural tension testing (radial nerve bias), but no reduction in neural range of motion. The patient completed the patient specific functional scale questionnaire (PSFS), with an initial result of 3/10 (note: 0/10 = total impairment; 10/10 = no impairment).

As outlined in the table, a multimodal treatment approach was taken. This included education and advice regarding the presenting complaint and activity modification, prescription of a counterforce brace, mobilization, acupuncture and a home exercise programme of tendon loading exercises.

Treatment

Treatment 1 (week 0)

Rationale for prescription used in treatment 1: As this was the patient's first experience with acupuncture, the number of points selected was limited to four and all were local to the injured area. This was to introduce the patient to acupuncture gently and gauge sensitivity. The local points were selected to stimulate A–δ and C fibres in order to encourage the release of calcitonin gene-related peptides (CGRP), substance P and neurokinin. Through these mechanisms, acupuncture can stimulate: 1) local vasodilation and increased vascular permeability (Sandberg *et al.* 2003), which may have a positive effect on pain and healing due to increased blood flow to the treatment site; 2) peripheral opioid analgesia (Stein *et al.* 2001), which may reduce the patient's pain 2–3 days following treatment.

As well as the low number and localization of needles, the treatment duration was limited to 10 min, and 0.25 mm needles were used, which was also to ensure the treatment dose was low to begin with.

Treatment 2 (week 1)

Subjective: After the initial treatment 1 week ago, the patient reported he had a mild increase in pain for 24 hours, followed by a modest reduction in pain.

Objective: When outcome measures were reassessed, PFGS with the elbow flexed to 90º and the forearm in mid-prone had increased to 15.1 kg for the left hand. With the elbow extended and the forearm pronated, PFGS had increased to 5.1 kg. PSFS remained at 3/10.

Rationale for prescription used in treatment 2: Due to the improvement in outcome measures and the lack of adverse reaction to treatment, it was decided to progress treatment, including acupuncture dose. Needling duration was increased to 15 min, with stimulation at 5 and 10 min. Large Intestine (LI) 4 was also added to increase distal stimulation, which has been suggested to activate supraspinal mechanisms and result in descending pain inhibition from the periaqueductal grey matter and the release of natural opioids (Bradnam 2003; Zhao 2008). This analgesic mechanism is also thought to be important for longer-term effects (Lundeberg 1998). Traditional Chinese medicine considers LI 4 to be a master point for pain and relaxation because it is a distal point along the Large Intestine meridian (White *et al.* 2008).

Treatment 3 (week 2)

Subjective: After the second treatment 1 week ago, the patient again reported a mild increase in pain for 24 hours before a proceeding reduction.

Objective: When outcome measures were reassessed, PFGS with the elbow flexed to 90º and the forearm in mid-prone had increased further to 22.4 kg for the left hand. With the elbow extended and the forearm pronated, PFGS had also further increased to 7.2 kg. PSFS began to demonstrate change, with an improvement to 5/10.

Rationale for prescription used in treatment 3: Due to further improvement and no adverse reaction, it was decided to progress treatment again, including acupuncture dose. Triple Energizer (TE) 5 was added to take the total number of needles to six. TE 5 was chosen to increase the stimulation along the same dermatome as the affected area. This had the intention of increasing dermatomal receptive input in the dorsal horn of the spinal cord and increase endogenous pain modulatory systems (Carlsson 2002; Bradnam 2003). To further progress dose, the needles were also stimulated twice rather than once, at 5 and 10 min.

Treatment 4 (week 4)

Subjective: After the third treatment 2 weeks ago, the patient reported no post-treatment soreness and continued to report reductions in pain. The patient did report some mild, intermittent "tightness" developing in the region of the forearm extensor muscle bellies, possibly an effect of the loading exercise progressions.

Objective: When outcome measures were reassessed, PFGS with the elbow flexed to 90º and the forearm in mid-prone had increased further to 40.3 kg for the left hand. With the elbow extended and the forearm pronated, PFGS had also further increased to 17.3 kg. PSFS also improved to 7/10.

Rationale for prescription used in treatment 4: Due to further improvement and no adverse reaction, as well as a muscular type "tightness" reported by the patient, it was decided to add two needles to the belly of the extensor muscles. Two active trigger points were identified along the extensor muscle compartment and a needle was inserted into each, using a fanning technique of repeated penetration while changing the direction of the needle until a twitch response was elicited. It has been proposed that trigger point needling can reduce hyperactivity of the muscle spindle and therefore the stretch reflex, decreasing acetylcholine release and reducing unnecessary muscle contraction (Norris 2001), in turn reducing the ischaemia which can cause muscle pain.

In addition to the addition of trigger point therapy, the dose was also increased through the use of 0.30 mm needles for all the acupuncture points (with the exception of LI 4 and the new trigger point needles).

Treatment 5 (week 6)

Subjective: After the fourth treatment 2 weeks ago, the patient reported no post-treatment soreness and continued to report reductions in pain and return to normal activities at home and work.

Objective: When outcome measures were reassessed, PFGS with the elbow flexed to 90º and the forearm in mid-prone was now pain free at 46.2 kg for the left hand. With the elbow extended and the forearm pronated, PFGS was now 40.1 kg, eliciting only very mild pain. PSFS was now 9/10.

Rationale for prescription used in treatment 5: The patient was keen to continue the home exercise programme and make this treatment his final appointment. Due to the positive response from the fourth treatment and the fact that the patient would not be followed-up after the fifth treatment, it was decided to repeat the same acupuncture intervention provided in the fourth treatment.

The patient will be followed-up via email in a further 4 weeks (after the submission of this case report) to ensure he is still on track for a full resolution of symptoms.

Discussion

The patient responded well to the physiotherapy treatment provided, which included acupuncture. Subjective improvements in function were demonstrated over the treatment period with a change in PSFS from 3/10 to 9/10. This was accompanied by objective improvements demonstrated by the change in pain-free grip strength from 1.4 kg to 40.1 kg with the elbow extended and wrist pronated.

Due to the multi-modal treatment application, it is hard to isolate the positive effect of the acupuncture from the other treatments

applied. The patient received a structured and graded tendon loading programme in parallel with his acupuncture treatment. There is evidence for the effectiveness of loading programmes in lateral epicondylalgia and therefore this may be the main reason for the patient's improvement. In this evidence, however, treatment effects from loading programmes do not tend to occur until at least the 6–8 week mark and often not until 12–24 weeks. As described above, this patient received a modest pain relief as early as 24 h following the initial session and was reporting lasting pain relief within the first few weeks. This does seem to support the efficacy of acupuncture in this patient, however it must be mentioned that activity modification and prescription of the counterforce brace may have also contributed strongly to this effect.

Alternative acupuncture approaches

The acupuncture protocol used with this patient was chosen based on a combination of evidence from the literature, physiological rationale and patient response. Other methods have been described in the literature and could have been used with this patient. Molsberger & Hille (1994) describe an alternative treatment protocol that utilizes the pain-relieving effects of a non-segmental distal point (Gall Bladder 34) on the ipsilateral leg to the affected lateral epicondyle. The needle was inserted to 2 cm depth and stimulated until De Qi was elicited while the patient performed movements with the painful arm. This resulted in a 55% pain reduction for an average of 20 h in the intervention group. This method could have been used as an alternative if the patient tolerated the local acupuncture poorly or had other local contraindications to acupuncture in the area, such as skin scarring or cutaneous nerve compromise. Another technique that could have been used was periosteal pecking, whereby a needle is inserted into the area of the lateral epicondyle and thrusted several times to touch the periosteum at the insertion of the extensor tendons. If the patient was unresponsive to the treatment described above and the acupuncture thus far was well tolerated, I would have considered using this technique.

Future research considerations

When investigating the use of acupuncture with this patient, it was clear that the overall body of evidence for acupuncture in the management of lateral epicondylalgia is limited, with only a small number of good quality RCTs. Therefore, further trials would be of value to strengthen the understanding of this intervention. In addition, further research with longer term follow-ups would be valuable due to the high recurrence rates of lateral epicondylalgia. Research exploring this question would be worthwhile to assess whether acupuncture in combination with a tendon loading programme resulted in a lower recurrence rate than a loading programme alone, as well as compared to other interventions such as corticosteroid injection. As is the case with the use of acupuncture in other pathologies, much of the lateral epicondylalgia research is complicated by the lack of a true therapeutically inert placebo comparison. Further RCTs which utilize a truly passive placebo would be of value to further tease out the benefit of acupuncture as an intervention.

References

Bisset L., Paungmali A. & Vicenzino B., *et al.* (2005) A systematic review and meta-analysis of clinical trials on physical interventions for lateral epicondylalgia. *British Journal of Sports Medicine* **39** (7), 411–422.

Bradnam L. (2003) A proposed clinical reasoning model for Western acupuncture. *New Zealand Journal of Physiotherapy* **31** (1), 40–45.

Calfee R. P., Patel A., DaSilva M. F. & Akelman E. (2008) Management of lateral epicondylitis: current concepts. *Journal of the American Academy of Orthopaedic Surgeons* **16** (1), 19–29.

Carlsson C. (2002) Acupuncture mechanisms for clinically relevant long-term effects-reconsideration and a hypothesis. *Acupuncture in Medicine* **20** (2–3), 82–99.

Cook J. L & Purdam C. R. (2009) Is tendon pathology a continuum? A pathology model to explain the clinical presentation of load-induced tendinopathy. *British Journal of Sports Medicine* **43** (6) 409–16.

Coombes B. K., Bisset L. & Vicenzino B. (2010) Efficacy and safety of corticosteroid injections and other injections for management of tendinopathy: a systematic review of randomized controlled trials. *The Lancet* **376** (9754), 1751–1767.

Ezzo J., Berman B., Hadhazy V. A., *et al.* (2000) Is acupuncture effective for the treatment of chronic pain? A systematic review. *Pain* **86** (3), 217–225.

Fink M., Wolkenstein E., Karst M. & Gehrke A. (2002) Acupuncture in chronic epicondylitis: a randomized controlled trial. *Rheumatology* **41** (2), 205–209.

Green S., Buchbinder R., Barnsley L., *et al.* (2001) Nonsteroidal anti-inflammatory drugs (NSAIDs) for treating lateral elbow pain in adults. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD003686. DOI:10.1002/14651858.CD003686.

Khan K. M. & Cook J. L. (2000) Overuse tendon injuries: where does the pain come from? *Sports Medicine and Arthroscopy Review* **8** (1), 17–31.

Lundeberg T. (1998) The physiological basis of acupuncture. *Conference presentation, MANZ/PAANZ Annual Conference, Christchurch, New Zealand, August 1998*.

Molsberger A. & Hille E. (1994) The analgesic effect of acupuncture in chronic tennis elbow pain. *British Journal of Rheumatology* **33** (12), 1162–1165.

Norris C. M. (2001) *Acupuncture: Treatment of Musculoskeletal Conditions*. Butterworth-Heinemann, Oxford.

Sandberg M., Lundeberg T., Lindberg L. G. & Gerdle B. (2003) Effects of acupuncture on skin and muscle blood flow in healthy subjects. *European Journal of Applied Physiology* **90** (1–2), 114–119.

Stein C., Machelska H. & Schäfer M. (2001) Peripheral analgesic and anti-inflammatory effects of opioids. *Zeitschrift fur Rheumatologie* **60** (6), 416–24.

Trinh K. V., Phillips S. D., Ho E. & Damsma K. (2004) Acupuncture for the alleviation of lateral epicondyle pain: a systematic review. *Rheumatology* **43** (9), 1085–1090.

Tyler T. F., Thomas G. C., Nicholas S. J. & McHugh M. P. (2010) Addition of isolated wrist extensor eccentric exercise to standard treatment for chronic lateral epicondylosis: a prospective randomized trial. *Journal of Shoulder and Elbow Surgery* **19** (6), 917–922.

Vicenzino B., Cleland J. A. & Bisset L. (2007) Joint manipulation in the management of lateral epicondylalgia: a clinical commentary. *Journal of Manual and Manipulative Therapy* **15** (1), 50–56.

White A., Cummings M., Filshie J. (2008) *An Introduction to Western Medical Acupuncture*. Churchill Livingstone/Elsevier, Edinburgh.

Zhao Z.-Q. (2008) Neural mechanism underlying acupuncture analgesia. *Progress in Neurobiology* **85** (4), 355–375.

Justin Walsh is a physiotherapist with experience of working in the public and private sectors of both the United Kingdom and Australia and is currently working within the private sector in south east London. He has a particular interest in treating musculoskeletal injuries, including tendinopathy.