

# Case study – Tennis Elbow

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### Introduction

Traditional Chinese acupuncture has been shown to be an effective therapy for reducing pain and improving function in an arm afflicted with common conditions such as tennis elbow (Ellis 2004).

Tennis elbow is also referred to as a lateral elbow tendinopathy (LET). LET presents with pain over the lateral aspect of the elbow normally at the antero-lateral epicondyle of the humerus which is aggravated by any repetitive, strenuous & monotonous movements at the wrist (Kessons and Atkins 2005; Vasseljen 1992). An absence of inflammatory cells at the site of lesion has been found with LET (Kessons and Atkins 2005; Kraushaar and Nirschl 1999; Khan et al 2000). The most commonly affected muscle is extensor carpi radialis brevis (Kraushaar and Nirschl 1999). Recent Psychoneuro-immunological studies found that stress also has an effect on the prolonged healing process of any tissues (Alford 2006).

The peak age for this condition is 35-54 years, and episodes can last from 6 months to 2 years (Assendelf et al 1996). In this case report the patient was a 39 year old man with a history repetitive loading to the common extensor origin at the elbow due to the nature of his job.

Literature suggests up to 64% of all LET cases are work related, with repetitive loading the main factor, and keyboard work and typing representing the majority of patients (Gellman, 1992, Vasseljen 1992 & Verhaar et al, 1993). The annual incidence of non-sport-related lateral elbow tendinopathy is 59 per 10,000 workers (Deignan 2003). Unaccustomed activities and repetitive wrist movements are thought to be the main cause, and on top of this up to 50% of tennis players suffer from a episode of LET as altered biomechanics predisposes tennis players to this condition especially if the backhand stroke is used often (Schnatz & Steiner 1993).

### Assessment

The patient was a 39 year old gentleman suffering from right lateral elbow pain. He worked full time as a heavy manual worker. There was no history of trauma and the onset was gradual starting 14 months ago with an intermittent twinge, progressing to constant ache. Sometimes the pain radiated down the radial aspect of the forearm. There were no neurological symptoms. The injury was now affecting activities of daily living and his work.

After one month with no improvement in pain he sought professional help from his GP, who diagnosed tennis elbow. Since then he had 3 steroid injections giving him pain relief for 3-4 months each time. It was between 3-4 months time after last injection that he attended the physiotherapy department for further treatment.

### 24 hour pattern

**Night:** His sleeps was disturbed if he lay on the elbow.

**AM:** This was when his pain was most severe –Numerical rating scale (NRS) -8/10 (10 being the most painful )

**PM:** Activity dependent, mostly felt constant dull ache (NRS-5/10).

**Aggravation factors:** Rotation of the forearm, pressure on the lateral epicondyle, any lifting, gripping and holding objects.

**Easing factors:** Rest, ice sometimes & painkillers

**Investigations:** None

**Past medical history:** Nil

**Drug history:** Occasionally painkillers- Paracetamol.

**Social history:** Married, one child, heavy manual work, no specific hobbies.

## **Differential diagnosis**

A cervical spine assessment was necessary to exclude any referred pain (Greenfield & Webster 2002) it was also important to rule out posterior lateral rotatory instability at the elbow (O'Driscoll 2000, Nestor et al 1992, Morrey 1992, Potter et al 1997)

## **Objective assessment**

He was a medium build gentleman with good developed muscles throughout and he walked with a slight flexion contracture of his right elbow. A slight swelling on the lateral epicondyle of the left elbow was noted, no muscle atrophy was seen in the upper limb. His neck, cervical spine, right GH joint and ULTT's did not reproduce any pain. He did not have a capsular pattern present at the right elbow or wrist. Passive right wrist flexion with elbow extension mildly increased the pain in the right elbow. He had decreased pronation due to pain throughout the movement (0-20 degrees) and the pain occurred with elbow extension and wrist extension together. His pain intensified over the lateral epicondyle with resisted middle finger extension (pain score- NRS 8/10.) Finally he had decreased muscle strength of extensor carpi radialis brevis (ECRB) –Manual muscle testing (MMT) - 3+/5.

## **Clinical diagnosis**

Based on the subjective and objective examination a diagnosis of right LET involving ECRB was made (Haker 1993; Greenfield and Webster 2002.) Histo-immunological studies suggest that the most commonly involved muscle is extensor carpi radialis brevis (ECRB) (Kraushaar & Nirschl 1999.)

According to a study by Greenfield & Webster (2002) a thorough cervical spine examination and radial nerve tension tests are important to consider when assessing the elbow joint as symptoms can be referred from the neck. In this case study the patient's cervical and radial nerve tension tests were negative. There were no neurological symptoms.

It is also important to consider posterolateral instabilities as a differential diagnosis especially with unremitting mechanical symptoms at the elbow (O'Driscoll 2000, Nestor et al 1992, Morrey

1992, Potter et al 1997). In this case the patient has no ligament laxity and no deformities at the elbow.

## **Treatment**

The aims of the treatment were to relieve pain, improve function, increase muscle strength and to educate the patient. The patient was getting frustrated about his problem as none of the treatment techniques were improving his symptoms; therefore the decision was made to try acupuncture to reduce his pain and improve his overall function.

Acupuncture was chosen because it has been shown to relieve pain, release tight muscles and fascia, increase circulation, improve sense of well being and promote relaxation (Gehrke et al 2002, Andersson & Lundeberg, 1995).

A recent literature review by Farren (2012) reviewed 3 RCTs which have investigated acupuncture in the treatment of LET and concluded that there is some evidence to support the use of acupuncture over a placebo, however the benefits appear to be short lived.

### **Objective markers:**

- AROM- pronation and wrist extension
- Pain on resisted ECRB contraction - NRS 8 /10.
- Decreased muscle strength of ECRB on MMT - 3+/5

### **Physiological reasoning for Acupuncture point selection**

The meridian chosen initially in this case was Large Intestine (LI); the site of pain was located along the C6 dermatome which fits well in with this meridian.

Distal points were used to gain analgesic effect as the patient did have some sleeping difficulties. LI4 & Liver (LV)3, also known as the 4 gates were used as they stimulate higher centres to get these analgesic effects (Kaptchuk, 2002). Local points were also selected as the patient's symptoms were in chronic in nature.

In this case study the patient presented with localised lateral elbow pain and the points which were used were LI10, 11 & 12 (Bradnam, 2003; Carlsson, 2002.) Research supports segmental needling and it is more effective especially in patients with localised lateral elbow tendinopathy (Chilton, 1997; Trinh et al, 2004; Tsui & Leung, 2002). However exact physiological mechanism of acupuncture on chronic pain is still debatable (Streitberger et al, 2008, Green et al (2002).

The following table below shows the patients steady progression and the points used to improve his condition.

**Treatment:**

<u>Date</u>	<u>Points selected</u>  Needle size used:  Distal - 0.25x25mm  Local – 0.25x 40mm	<u>Adverse response</u>	<u>Other treatment</u>	<u>Time</u>	<u>De Qi</u>	<u>NRS Pain Score on resisted ECRB contraction (post treatment)</u>
27/08/09	Bilateral LI4 & LI10, 11 & 12	No	Continue with self frictions, stretching & eccentric loading exercises at home	20 mins	Yes	No change 8/10
02/09/09	As above + additional SI 8	No	Same as above	20 mins	Yes	7/10
08/09/09	As above	No	As above	30 mins	Yes	4/10
16/09/09	As above	No	As above	30 mins	Yes	2/10
29/09/09	As above	No	As above	20 mins	Yes	1/10
06/10/09	None	-	To be continued as above but with eccentric loading exercises adding 500grams of weight.	20 mins	-	Remains 1/10

**Results**

On the patients last visit to the department the following objective and subjective markers were achieved and he was able to sleep without any disturbances. He had full active pain range of movement into pronation and wrist extension. On resisted contraction of ECRB his NRS pain score was 1/10 and his muscle strength of ECRB on MMT - 4+/5

**Discussion**

Prior to starting acupuncture treatment patient was advised to stop taking analgesics (paracetamol). The patient was advised not to undertake any strenuous activities and movements

at the wrist. Long term prognosis is often dependent on altering causative factors (Kessons & Atkins 2005).

The first 3 treatments consisted of ultrasound, frictions, stretches, and ice. The patient was advised to do frictions, stretches of the forearm and to apply ice x2 daily.

Ice was used as it may help to decrease the extravasation of proteins and blood from the capillaries at the site of lesion. However according to a study by Manias (2006) it was found to be of no benefit in patients with LET. Ultrasound treatment was also tried but did not make any difference to the patient's symptoms. There is also no evidence to support or refute the effects of ultrasound therapy (D'Vaz et al 2006, Bisset et al 2005).

Deep transverse frictions were applied to relieve pain by modulation of nociceptive impulses and it is also believed to soften scar tissue and break up the adhesion formation by disrupting the fibrils attachments (Cyriax 1982; Gregory et al 2003). However the patient noticed no effect from frictions.

The patient was also instructed to do eccentric loading exercises for the common extensor origin (CEO); a commonly used exercise for injured tendons (Selvier & Wilson 2000; Khan et al 2000 & 2002; Stanish et al 2000). Stretching exercises were administered to the patient to maintain the flexibility of the tendon. There are different varieties of stretching techniques but the most widely used variety is static stretching as it is more effective than others (Noteboom et al 1994; Selvier & Wilson 2000; Stanish et al 2000).

All above interventions did not make any difference to patient's symptoms; therefore acupuncture was recommended. After the first session the patient noticed no change with his pain. He was advised to continue with the home exercise programme.

SI8 was added in the second session; another yang meridian. After that session the patient felt an immediate reduction in pain. The patient received acupuncture at the same points for subsequent sessions as he was making steady progression.

Following 5 treatments, acupuncture appeared to have made a significant improvement in reducing the patient's pain and improved this quality of life. On his last session patient had increased function, he was able to perform pain free full range of motion at the elbow and wrist in all directions, and his muscle strength was almost as strong as on the left side. At this point he was given an open appointment for 4 more weeks and advised to continue with home exercises.

Completing this case study has increased my knowledge base in the area of acupuncture and its effects on lateral elbow pain. There are various physical interventions available to treat lateral elbow tendinopathy but very little evidence was found to support or refute those interventions due to low statistical power, low sample size and inadequate validity, therefore further research is indicated to see the effectiveness of various treatment techniques and to manage this condition more effectively (Bisset et al 2005, Stasinopoulos & Johnson 2004).

## **Limitations**

Most case studies are single centred and involve a single subject; consequently they have inferior value in hierarchy of evidence (Harbour & Miller, 2001). The NRS pain score, ROM and manual muscle testing were used as objective markers. Validated functional outcome measurements and hand grip dynamometer could have been used as an objective marker, but unfortunately a hand grip dynamometer was not available.

Surrounding the dragon, another type of needling technique used for LET, could have been used which has been found to produce good results. However the patient was making progress with the local points; therefore this technique was not tried.

Another limitation of this study was time as due to trust policies patients were allowed only a certain number treatments, this resulted in pressure on speeding up the patient's progression. This case study did not give me the chance to see the long term effects of acupuncture. Multi-centred or randomised control trials with long term follow up are required to see the effectiveness of acupuncture on chronic conditions.

## Conclusion

Since completing this study I have reacquainted myself with the use of acupuncture for chronic pain. Acupuncture has proved to be useful and I now have a clearer picture as to when acupuncture is appropriate as well as to how various points can affect treatment dramatically.

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