

# Treatment of a Grade Two Sprain of the Anterior Talofibular Ligament with Acupuncture and Moxibustion

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## ABSTRACT

This case report presents the treatment of a grade two sprain of the anterior talofibular ligament of a 24-year-old basketball player with acupuncture and moxibustion. Shallow needle technique and needle head moxibustion were applied at various intervals during treatment. However, the primary traditional Chinese medicine intervention was heat perception moxibustion. This method of moxibustion forms the foundation of the author's approach to acute injury management and involves the application of heat to injuries exhibiting significant signs of inflammation. No exacerbation of symptoms was noted when moxibustion was used in this case report. There were no reported incidences of re-injury during recovery and rehabilitation and return to participation were quick. Information pertaining to the incidence, nature and recovery periods associated with grade two ligament sprains, along with details of the different point selection methods used for acupuncture and moxibustion treatment, provide background for the case report. An example of the author's treatment of acute injury with moxibustion is presented in the case history. The discussion identifies a lack of information about moxibustion in the English literature and concludes that more effort is required in the areas of historical, clinical and scientific research if a comprehensive understanding of the mechanisms of action of moxibustion and the role they play in acute injury management is to emerge in an English-speaking context.

**KEYWORDS** acute injury, grade two sprain, heat perception, moxibustion, research.

## Introduction

Ankle sprains are one of the most common types of sporting injuries. The Australian Sports Commission estimates that an ankle sprain occurs in Australia once every 44 seconds.<sup>1</sup> All sprains are graded according to the severity of the injury involved. A grade two sprain of the anterior talofibular ligament (ATFL) is considered a moderate injury and involves partial tearing of the ligament, resulting in moderate pain and swelling. Patients usually have difficulty with weight bearing

and range of movement (ROM) is restricted. A series of events, called the inflammatory response, follow a grade two ligament injury and produce redness, heat, swelling, pain and loss of function at the site of injury. These events are known as the five cardinal signs of inflammation and are not commonly treated with heat.

Conventional protocols for the rehabilitation of grade two sprains of the ATFL are well established.<sup>2,3</sup> Recovery takes four

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to eight weeks or longer,<sup>4</sup> with maximum benefit being gained after at least ten weeks of conventional rehabilitation.<sup>5</sup> The traditional Chinese medicine (TCM) treatment described in this case report continued for a total of six weeks and involved the use of acupuncture and moxibustion. Acupuncture treatment involved the use of shallow needle technique (SNT),<sup>6</sup> whilst moxibustion treatment involved the use of heat perception moxibustion (HPM)<sup>6</sup> and needle head moxibustion (NHM).<sup>6</sup> Both distal and local points were used during treatment. Distal points received acupuncture, whilst local points received a combination of acupuncture and moxibustion.

Distal point selection and angle of needle insertion were determined by palpation of the channels that traversed the injured area. Close attention was given to points that, when firmly pressed with the thumb, reduced the athlete's subjective sensation of pain in the ankle during rest and active range of movement (AROM). These points were then examined to determine if angle of palpation pressure further reduced the subjective sensation of pain in the ankle during rest and AROM. Points pressed 45% in the direction of the flow of Qi in the meridian proved most effective in this case report and were selected for treatment using SNT.

Local point selection was determined by visual and physical examination of the injured area, looking for evidence of one or more of the five signs of inflammation. Local points with significant evidence of inflammation were selected for treatment using HPM. NHM was not applied to the injured area until the signs of inflammation had almost completely disappeared.

## Case history

A 24-year-old male athlete presented in a clinic one morning with an injury to the anterior-lateral aspect of the left ankle. The injury had occurred the night before on a basketball court when landing awkwardly after attempting a short run-jump shot at the hoop. The ankle had inverted, rolling medially and slightly posteriorly, and a popping sound was heard on impact. Ice had been applied to the injury for an approximate total of three hours as the athlete waited to be seen by a doctor at his local accident and emergency department.

X-ray examination showed no damage to the bones of the lower leg and foot. The attending accident and emergency doctor diagnosed a grade two sprain of the ATFL. Analgesic and non-steroidal anti-inflammatory medication (ibuprofen) was prescribed for a period of one week, along with protection, rest, ice, compression, elevation and support (PRICES).

When the athlete arrived at the acupuncture clinic the morning after the injury, he walked with the assistance of

crutches. When questioned, he reported limited weight-bearing capability. However, unassisted walking produced moderate to intense pain, rated by the athlete to be 8 out of 10 (where 1 = no pain and 10 = intense pain). The radial pulse was slightly rapid and wiry. His tongue and abdomen were unremarkable and his responses to standard TCM diagnostic questions<sup>7</sup> revealed no clinically significant information with respect to his presenting condition. Apart from his injury, he appeared to be in good physical condition and was keen to achieve a speedy recovery and return to participation.

A moderate amount of redness, heat and swelling was observed over the anterior-lateral surface of the ankle. Passive range of movement (PROM) of the injured ankle was observed to be limited when compared to PROM of the healthy ankle. The athlete reported that AROM, especially active dorsiflexion with external rotation of the injured ankle, produced moderate pain (7/10) in the anterior-lateral region of the ankle. The Anterior Talofibular Drawer Test produced a negative result for functional instability. Signs of inflammation and bruising with pain on palpation (4/10) were observed just inferior and posterior to the medial malleolus. There was no previous history of ankle injury or functional instability of the left ankle.

## TCM DIAGNOSIS

Local Qi and Blood stagnation of the Stomach, Gall Bladder and Kidney channels of the left lower leg due to trauma.

## BIOMEDICAL DIAGNOSIS

Grade two sprain of the anterior talofibular ligament.

## TCM TREATMENT PRINCIPLE

Relieve pain, resolve stagnation, reduce swelling, cool heat, to increase ROM, reduce recovery time and return the athlete to pre-injury level of participation using acupuncture and moxibustion.

## FIRST TREATMENT – 14 HOURS POST INJURY

Distal points chosen for the first visit were ST 36 *Zusanli*, ST 38 *Tiaokou*, GB 34 *Yanglingquan* and BL 58 *Feiyang*. Needles that were 30 mm in length and 0.18 mm in diameter were inserted into these points and retained for ten minutes whilst local points were located and treated. Needle insertion was reported to be painless. There was no attempt to solicit Deqi and no additional needle manipulation was performed.

Local points were chosen from areas of the foot that exhibited the most redness, heat, swelling and/or pain on movement. On the anterior-lateral surface of the ankle, GB 40 *QiuXu* (located just above the anterior talofibular ligament), GB 41 *Zulingqi*, ST 41 *Jiexi*, and BL 62 *Shenmai* were selected for treatment. On the medial surface of the ankle, KI 6 *Zhaohai*, KI 3 *Taixi*, and KI 5

*Shuiquan* were selected for treatment. One round of HPM was applied to each point to reduce the signs of inflammation. The athlete was then advised to stop applying ice to the injury and to continue using crouches whenever moving about. Analgesic and non-steroidal anti-inflammatory medication continued as prescribed by the accident and emergency doctor.

#### SECOND TREATMENT – ONE AND A HALF DAYS POST INJURY

The athlete returned to the clinic the following morning for a second consultation, during which time his progress was assessed and the HPM component of the first treatment repeated. As he had no history of peripheral neuropathy, blood pressure problems or mental abnormalities, the athlete was asked to observe the moxibustion procedure with the view of repeating the treatment at home. The athlete was equipped with detailed verbal and written instructions on the safe and effective use of moxibustion in the home environment and asked to burn one cone of prefabricated HPM on each point (as marked by a blue surgical marker), morning and night, for three days before returning to the clinic for an assessment of his progress.

#### THIRD TREATMENT – FOUR AND A HALF DAYS POST INJURY

When the athlete returned to the clinic three days later, active dorsiflexion pain had reduced (5/10) and a significant reduction in local redness, heat and swelling was noted. Pressure pain at the medial-superior border of the calcaneal bone had also reduced (3/10). Distal points (ST38 *Tiaokou*, GB34 *Yanglingquan* and BL58 *Feiyang*) were located via palpation and treated as described above. Local points were also chosen and treated as described above. As home treatment was proceeding smoothly, the athlete was asked to continue twice daily applications of moxibustion for another three days before returning to the clinic.

#### FOURTH TREATMENT – SEVEN AND A HALF DAYS POST INJURY

By the fourth treatment the athlete had completed the recommended course of ibuprofen. Though he presented in clinic unaided by crotches he still walked with a slight limp. Redness, heat and swelling in the ankle had almost completely disappeared and dorsiflexion pain had reduced (2/10). Pain on palpation at the medial-superior border of the calcaneal bone was also minimal (1/10). However, some AROM restriction was noted when the toes were moved medially through a wide arch. Distal points equating to ST38 *Tiaokou*, GB34 *Yanglingquan* and BL58 *Feiyang* were located and treated as described above.

As inflammation at the site of injury had almost completely disappeared, needle head moxibustion (NHM) was performed

in preference to HPM. Only GB40 *Qiuxu* was treated during the fourth treatment. A 30 mm × 0.18 mm needle was inserted into the point to a depth of half a cun and heated for 10 minutes with a prefabricated, smokeless form of NHM called *On Dan*<sup>TM</sup>. This resulted in an immediate improvement in AROM post-treatment.

By the end of the fourth treatment the athlete was capable of walking without a limp. Therefore, he was advised to return to graded balance and weight training under the supervision of his strength and conditioning coach. NHM treatment of GB40 *Qiuxu* continued, as described, for another five weeks at five- to seven-day internals. This was done to ensure adequate Qi and Blood circulation through the injured area to maintain ROM and to minimise the extent of scar tissue development at the site of the sprain. In addition, HPM was applied at home on an 'as needed' basis any time the athlete noticed post-exercise inflammation or fatigue in the ankle. No incidence of re-injury was reported during the acupuncture and moxibustion treatment period. One month post-injury the athlete reported that strength had returned to the ankle. After six weeks of acupuncture and moxibustion intervention the athlete reported that he was back playing basketball at pre-injury levels of participation.

## Discussion

This case report presents a complex treatment regime for the management of a grade two sprain of the ATFL including PRICES, anti-inflammatory and pain medication, acupuncture, moxibustion and professional conditioning training. As moxibustion forms the foundation of the author's approach to acute injury management, it will be the focus of the following discussion.

Scientific investigation into the mechanisms of action of moxibustion has taken place in East Asia since at least the early 1900s.<sup>8</sup> To date, very little of this research has been reported in the English literature and the mechanisms of action of moxibustion are poorly understood in this context. Understanding of the uses of moxibustion has evolved largely from historical research and the clinical observations and subsequent hypothesises of practitioners in the field, rather than scientific discourse.

Historical research reveals that the practice of moxibustion was divided into two categories, namely the scarring and non-scarring moxibustion traditions.<sup>6</sup> Both traditions are practised today and are commonly used to warm the meridians and expel cold, to induce the smooth flow of Qi and Blood, to strengthen Yang from collapse and to prevent diseases and maintain health.<sup>9</sup> Historical research also reveals that moxibustion can be used to guide excess heat and Yin deficiency heat to

exit the body.<sup>10</sup> Though some authors refute this use of moxibustion,<sup>10</sup> the following contemporary hypothesis – known as the ‘Moxibustion Continuum’ – attempts to explain how moxibustion causes heat to exit the body. This hypothesis states that:

When the surface area [or base of a cone] of moxa is large, the heat will have little penetrative ability, so will go to the surface, activating the defensive ki [i.e. Qi] and, therefore, tonifying the yang ki. Since one of the main functions of yang ki is to radiate heat out of the body, putting heat into this level will cause the body to warm up and disperse heat outwards, often with localised sweating, which causes cooling and thus dispersion.<sup>11</sup>

The use of HPM in this case report was based on the hypothesis of the Moxibustion Continuum. Each cone was large, approximately 1 cm tall by 1 cm wide at the base, and was applied directly to the skin. Each cone burnt for about one minute and was removed the moment the athlete reported an itchy, hot sensation under the cone. HPM was developed by Keiri Inoue (1903–1967)<sup>12</sup> and belongs to the non-scarring moxibustion tradition. In East Asia it is believed to have anti-inflammatory effects<sup>8</sup> and is often used to disperse stagnant Qi.<sup>13</sup> As such, HPM can be applied to areas with pain and heat<sup>13</sup> to treat conditions such as arthritis, neuralgia and sprains.<sup>12</sup>

In the author’s clinical experience, the application of HPM to injuries, such as sprains, almost always results in a reduction of the signs of inflammation, an amelioration of symptoms and a fast recovery and return to participation. However, as little moxibustion research has been reported in the English literature, it is not possible to conclude that HPM was the intervention responsible for the results noted in this case report. It could be argued, for example, that ibuprofen, and not HPM, was responsible for the reduction of symptoms. Indeed, it could be argued that ibuprofen actually prevented any exacerbation of symptoms that may have occurred when HPM was used in this case report.

Clearly, a more comprehensive understanding of moxibustion is needed. For this to occur, continued efforts are required in the areas of historical and clinical research as well as case reports. However, the author concludes that until significant efforts are directed towards understanding the science of moxibustion, its mechanisms and the role they play in acute injury management are likely to remain a mystery in the English-speaking context.

## Conclusion

This case report presented the treatment of a grade two sprain of the ATFL. A complex treatment regime was described including conventional and TCM interventions. TCM intervention involved acupuncture and two types of moxibustion. Of the two types of moxibustion described, HPM was utilised during the inflammatory phase of recovery. NHM was only applied once the signs of inflammation had significantly reduced. In the case history the author presented a treatment in which moxibustion was applied directly over the inflammation of acute injury. No incidence of re-injury occurred during recovery, whilst rehabilitation and return to participation were quick. The discussion noted a long history of scientific investigation into the mechanisms of action of moxibustion in East Asia, and reported a paucity of information about moxibustion in the English literature. In conclusion, for a more comprehensive understanding of the mechanisms of action of moxibustion and the role they play in acute injury management to emerge in the English literature, more historical, clinical and scientific enquiry is required.

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## Clinical Commentary

The case report will be of particular interest to TCM practitioners seeking a simple yet effective way to manage the redness, heat, swelling, pain and loss of function associated with acute injury. Readers are presented with an example of the treatment of a common sports injury with moxibustion. Recovery and return to participation were quick and the athlete did not report any incidence of re-injury during the treatment period. Practitioners familiar with the heat perception moxibustion method can expect to achieve similar treatment outcomes to those presented in this case report. As the use of moxibustion in the management of acute injury has not been widely discussed in the English literature, this case report also identifies an exciting avenue of research for interested parties.

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