

Thoracic Outlet Syndrome Treated with Acupuncture, Manual Techniques and Self-stretching Exercises: A Case Report

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ABSTRACT

A case of thoracic outlet syndrome (TOS) treated with a combination of acupuncture, manual techniques and self-stretching exercises is presented. Brief literature reviews show that there are few documents relevant to TOS and acupuncture. Accumulation of the documented clinical cases will assist with further assessment of the benefits of Chinese medicine for this condition.

KEYWORDS thoracic outlet syndrome, TOS, acupuncture, Chinese medicine.

Introduction

Thoracic outlet obstruction syndrome, or thoracic outlet syndrome (TOS), is also called scalenus anticus syndrome, neurovascular compression syndromes of the shoulder girdle, or cervical rib syndrome.¹ TOS is characterised by pain, numbness, tingling, and/or weakness in the arm and hand due to compression of the brachial plexus and subclavian artery or vein as they pass from the cervical nerve roots to the axilla, through the thoracic outlet, which is constrained by the anterior middle scalene muscles, clavicle, and first rib.² It has been suggested that TOS is the most underrated, overlooked, misdiagnosed and important peripheral nerve compression in the upper extremity.³ TOS is also the most difficult entrapment neuropathy encountered by neurosurgeons.⁴ Talmage and Lemke reviewed the history of TOS in 1999.⁵ Classifications of TOS are based on the tissues that are compressed in the thoracic outlet. The prevalence of TOS varies from study to study.⁵ Diagnosis of the syndrome depends on careful medical history-taking and physical examination.⁴ The subclavian

artery or vein can be compressed by a spasm of the scalenus anterior and scalenus medius or by an extra cervical rib. An Adson test is used to determine the state of the subclavian vessels.⁶ Woods reported that 459 out of 1958 cases (23%) of cervical soft tissue injury were diagnosed as TOS; of these patients, 41% (185 out of 459) failed to respond to conservative therapies.⁷ Although there is moderate evidence that acupuncture can relieve chronic pain in neck disorders,⁸ over the years, there have been few cases reported in English which record the management of TOS by Traditional Chinese Medicine (TCM).

The TOS case reported here was treated with a combination of acupuncture, manual techniques (*shou fa*, 手法) and self-stretching exercises, with a satisfactory clinical outcome.

The case

CASE HISTORY DESCRIPTION

A 19-year-old male visited a TCM clinic in Melbourne,

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Victoria, Australia, on 31 March 2006, complaining of a constant, dull pain in the right neck and shoulder for the previous 30 days.

The man claimed that he had sustained a fracture on the right clavicle three years earlier due to a sport injury. The fractured bone went on to union without proper reduction and there was an anterior angulation deformity of the bone. Since then, he had suffered from dull aching on his right neck and shoulder. He had been treated with physiotherapy with a certain degree of pain relief.

The right neck and shoulder pain had been aggravated 30 days prior to presentation when the patient spent several hours painting walls in the factory where he was employed. The pain was constant, dull, aching, and referred up to the occipital region on the same side. There was neither weakness nor pins and needles in the arm or fingers. Range of motion (ROM) of the shoulder girdle was tested with 90° in flexion, 90° in abduction, 40° in adduction, 45° in extension and 90° in elevation. Muscle strengths of the right deltoid, biceps and triceps were 5 (normal), based on Muscle Gradations. Result of an Adson test was positive on the right side.

DIAGNOSIS

Thoracic outlet syndrome (non-specific type); tendon injuries (*shang jin*, 伤筋) in TCM diagnosis.

TCM DIFFERENTIATION OF SYNDROME

(*Zhong yi bian zheng*, 中医辨证)

Stagnation of Qi and Blood in the muscles, tendons and channels (*qi zhi xue yu*, 气滞血瘀, *jing mai shou zhu*, 筋脉受阻).

TREATMENT OBJECTIVE

Relieve pressure of the brachial plexus by softening the spasm of the scalene muscles.

TCM TREATMENT PRINCIPLE

Invigorate Qi and Blood circulation, unblock the channels and ease the pain (*xing qi huo xue*, 行气活血, *tong jing zhi tong*, 通经止痛).

TREATMENT

Treatment included acupuncture, manual techniques and self-stretching exercises.

The patient lay on his left side and acupuncture points on the right side were selected. They were GB21 *Jianjing*, LI16 *Jugu*, GB12 *Wangu*, LI14 *Binao* and one Ashi point (阿是穴) on the lower portion of the scalenus anterior and scalenus medius muscles respectively. At each point a gauge filiform needle (0.25 cm in diameter) was inserted. The depth of insertion varied

from 10 mm to 20 mm based on the thickness of the muscles where the acupoints were located. Needles were retained in the points for 30 minutes with twisting manual stimulations for a few seconds at 10-min intervals in order to further activate Qi movement in the channels.

Gentle manual techniques including circular rubbing (*mo fa*, 摩法), cross-fibre poking (*bo luo*, 拨络), kneading (*rou fa*, 揉法) and rolling (*gun fa*, 滚法), were performed on the affected areas following the acupuncture treatment.

Self-stretching exercises⁹ were demonstrated and the patient was instructed to do a 5-min stretching exercise twice per day.

FOLLOW UP AND OUTCOMES

A second visit was made on 4 April 2006. The patient reported that the pain had decreased remarkably. An Adson test produced a negative result. The same treatment modalities, delivered in the same way as at the first consultation, were applied.

Three more sessions of treatment were given on 8 April, 13 April and 24 April 2006 and the patient had no complaint of neck and shoulder pain at the last visit.

Literature Review

Thoracic outlet syndrome (TOS) is common; however, treatment of TOS by acupuncture or other TCM therapies has been rarely discussed in the English literature. The online databases of PubMed, PubMed Central, Acubrief, ProQuest and Cochrane Library were searched for the term 'thoracic outlet syndrome'. The search yielded 4655 items. A further search for 'thoracic outlet syndrome AND acupuncture' resulted in only one article, and its content was not relevant to TOS.

Discussion

The term 'thoracic outlet syndrome' does not exist in TCM; however, the condition may be categorised as 'Tendon injuries (*shang jin*)' or 'Bi-syndrome (痹证)' or 'Flaccidity syndrome (Wei-syndrome 痿证)' based on its clinical manifestations. The general principles of the treatment for tendon injuries or Bi-syndrome are to unblock the channels and collaterals and invigorate Qi and Blood circulation. For the management of TOS, manual techniques, applications of Chinese herbal medicines (externally or orally) and corrective exercises are recommended.¹⁰ In this case, an integration of acupuncture, manual techniques and self-stretching exercises was employed. The selected acupoints were focused on the local affected region, the thoracic outlet and the involved muscles, the scalenus anterior and scalenus medius. The rationale for selecting local acupoints can be traced back to the origin and foundation of TCM theory and practice: the Spiritual Pivot (*Ling Shu*, 灵

枢). It is written that 'the tendon of Hand Taiyang begins from above the little finger . . . and ends at the posterior of the ear Wangu. Heated needling is used, inserting and withdrawing the needle quickly and repeatedly until the pain is relieved; the tender spot serves as the acupoint. This is called Late-summer Bi-syndrome.' ("手太阳之筋, 起于小指之上...结于耳后完骨, ...治在燔针劫刺, 以知为数, 以痛为输, 名曰仲夏痹也") (Spiritual Pivot Scroll 4, Chapter of Jing Jin, 灵枢 • 经筋). Furthermore, it is written, 'Disorder on the muscles and skin with pain is called muscular Bi. The disorder is due to invasion of cold and dampness pathogens. Multiple and deep puncturing in the major and minor muscles should be given until the patient feels warm.' (病在肌肤, 肌肤尽痛, 名曰肌痹。伤于寒者, 刺大分小分, 多发针而深之, 以热为故) (Plain Questions Scroll 14, Chapter of comprehensive acupuncture techniques, 素问 • 长刺节论). If TOS is manifested with pain, coldness and numbness at the affected area with history of exposure to cold environment, then Painful-Bi (*Tong Bi*, 痛痹) is diagnosed in TCM; if TOS is associated with oedema of the upper arm, then Fixed-Bi (*Zhao Bi*, 着痹) is diagnosed. If TOS is manifested with atrophy and weakness of the involved muscle, Flaccidity Syndrome (*Wei-syndrome*) is diagnosed. In this case, the patient had a history of fracture and overuse of the shoulder and arm; therefore the 'Tendon injuries' diagnosis was most fitting with respect to the TCM osteotraumatology diagnostic definition.

In neurological or orthopaedic diagnostic criteria, the condition may be further classified as Type I 'compression of the brachial plexus (neurogenic TOS)'; Type II 'compression of the subclavian artery or vein (vascular TOS)' or Type III 'non-specific or disputed type of TOS'.⁴ Type I is mainly pain, pins and needles or weakness and/or atrophy of the brachial plexus innervated muscles, for example, the deltoid. Type II manifests as ischaemia pain and/or coldness, pallor on the involved arm if the subclavian artery is occluded and purple or oedema on the affected arm if the subclavian vein is compressed. Type III TOS is atypical and lacks objective neurological signs. A combination of Type I and Type II is also seen in clinical practice. As the diagnosis of TOS relies foremost on medical history-taking and clinical physical examinations, including orthopaedic special tests, this condition can be easily misdiagnosed. TOS should be differentiated from the disorders in the neck and shoulder regions with pain, such as cervical spondylosis, tears of the rotator cuff, supraspinatus tendonitis, adhesive capsulitis, etc. Positive finding of orthopaedic special tests, such as the Adson test, are important in supporting the diagnosis.

In this case, the patient had a previous history of clavicle fracture with angulation deformity that could narrow the space of the thoracic outlet. Furthermore, during the sustained exertion of painting, the patient over-stretched the pectoralis minor muscle, which could compress the lower brachial plexus.

Final assessment is determined by the positive finding of an Adson test. Precise conduction of the Adson test is essential. The examiner should stand behind the patient's involved side, instruct the patient to take a deep breath and rotate the head to the affected side while passively performing the manoeuvres of abduction, external rotation and extension of the involved arm. A positive finding occurs when the examiner detects alteration of strength or absence of the radial pulse in the involved arm when conducting the above manoeuvres. The patient should not hold the breath after rotating the head, as this might induce a pseudo-positive finding of the test. The opposite arm should always be examined, as it may serve as a gauge when performing orthopaedic tests. If it is possible, CT scan, MRI or electromyography should be carried out for differential diagnosis in order to exclude other pathologies with similar clinical pictures.

Conclusion

Thoracic outlet syndrome (TOS) is a clinical condition that is often underrated, overlooked, and misdiagnosed. A combination of acupuncture, manual techniques and self-stretching exercises has shown beneficial outcomes in the treatment of a patient presenting with clinical symptoms and signs consistent with TOS. There are few documents that show the efficacy and safety of TCM modalities for the treatment of TOS. As such, accumulation of the documented clinical cases will assist in the further assessment of the benefits of Chinese medicine for this condition.

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