

Diagnosis and Treatment of Atypical Thoracic Outlet Syndrome*

Qi Yifan¹, Cheng Tingxiu^{2*}

¹School of Basic Medical Science, Air Force Medical University, Xi 'an 710032, China

²The First People's Hospital of Dongning City, Dongning 157299, China

*Corresponding Author: Cheng Tingxiu, The First People's Hospital of Dongning City, Dongning 157299, China, E-mail: chengtingxiu@163.com

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Abstract

With the progress of society, the development of science and technology, and the popularization of digitalization, the number of patients seeking treatment for "hand numbness" in the outpatient department of rehabilitation medicine is increasing day by day, and it shows a younger age, even some teenagers; Most of them are diagnosed as cervical spondylosis, but according to the treatment of cervical spondylosis, the effect is not good, sometimes prolonged and not cured, which has different degrees of impact on the work and life of patients, and even affects the physical and mental health of patients. Clinical findings show that many patients are not simple cervical spondylosis, but atypical thoracic outlet syndrome. The diagnosis of typical thoracic outlet syndrome is easier, but the diagnosis of atypical thoracic outlet syndrome is more difficult. In addition, many clinicians have little understanding of atypical thoracic outlet syndrome, which is easy to cause missed diagnosis. Most patients are diagnosed in hand surgery, but the diagnosis rate of orthopedic doctors is low. Therefore, the author summarized the atypical thoracic outlet syndrome in order to improve the understanding of atypical thoracic outlet syndrome.

Data and Methods

General Information

The 86 patients in this group were from the neck and low back pain rehabilitation clinic of the Department of Rehabilitation Medicine of Dongning First People's Hospital from January 2019 to January 2023, including 39 males and 47 females, aged 17-65 years, with an average age of 42.5 years. The duration of the disease ranged from 2 weeks to 5 years, with an average of 11 months. The main clinical manifestations were numbness, distension and pain of shoulder, arm and hand. The numbness of the hand is mainly manifested as numbness of the whole finger, which is not distributed according to a single peripheral nerve. The pain of the upper limb is mainly distal, and the numbness and swelling pain are obvious in the morning. Some patients have limited hand swelling pain in the morning and their fists are improved after activity. Bilateral 50 cases, unilateral 36 cases; There were 28 cases with neck and back pain, 12 cases with chest tightness and chest pain. Cervical MRI examination showed cervical curvature changes, degenerative changes, cervical disc bulging, protrusion, etc. 66 cases of cervical spondylosis, 8 cases of coronary heart disease, and 12 cases of thoracic outlet syndrome were first diagnosed.

Muscle Examination Methods

Muscle Tenderness Point Detection [1]

The tenderness points of neck, chest and back muscles were detected respectively. There were 80 cases (93.02%) of pectoralis major muscle tenderness, 78 cases (90.70%) of pectoralis minor muscle tenderness, 76 cases (88.37%) of scalene muscle tenderness, 58 cases (67.44%) of subclavian muscle tenderness, 36 cases (41.86%) of trapezius muscle tenderness, 30 cases (34.88%) of supraspinatus muscle tenderness. Sternocleidomastoid tenderness was 28 cases (32.56%), serratus anterior tenderness was 26 cases (30.23%), rhomboid muscle tenderness was 24 cases (27.9%), scapular levator muscle tenderness was 18 cases (20.93%), latissimus dorsalis tenderness was 13 cases (15.11%), deltoid muscle tenderness was 13 cases (15.11%). There were 12 cases (13.95%) of sternal muscle tenderness and 10 cases (11.62%) of suboccipital muscle tenderness.

Muscle Length Detection [2]

According to The janda approach of muscle imbalance [3], The muscle length of scalene muscle, pectoralis major muscle and pectoralis minor muscle were detected respectively. There were 78 cases (90.70%) of pectoralis minor, 76 cases (88.37%) of pectoralis major and 74 cases (86.05%) of scalene muscle.

Special Test Detection [4,5]

Special tests related to thoracic outlet syndrome were performed. 36 patients (41.86%) were positive in arm lift compression test, 30 patients (34.88%) were positive in squint muscle compression test, 20 patients (23.25%) were positive in costoclavicular joint test, and 20 patients (23.25%) were positive in hyperabduction test.

Treatment Methods

Traditional Chinese massage technique is used to massage the stiff and short neck muscle group and chest and back muscle group, focusing on the treatment of scalene muscle, pectoralis major muscle, pectoralis minor muscle and other muscles; At the same time, the scalene muscle, pectoralis major muscle, pectoralis minor muscle and other short rigid muscles were stretched; And the corresponding muscle strength training was carried out on the antagonistic muscle group. At the same time, the acromioclavicular joint was loosened. 2 weeks for 1 course.

Evaluation Criteria of Curative Effect

Formulated with reference to the Criteria for the Diagnosis and Efficacy of TCM Diseases [6] issued by the State Administration of Traditional Chinese Medicine. Cure: shoulder, arm and hand numbness, pain and other symptoms disappear, accompanied by symptoms also disappear; Improvement: the numbness, distending pain and other symptoms of shoulder, arm and hand are reduced, and the accompanying symptoms also disappear or reduce; Ineffective: numbness, swelling and pain of shoulder, arm and hand did not improve, and accompanying symptoms did not improve. Effective rate = (cure + improvement)/n × 100%

Results

1-2 courses of treatment; The average treatment was 18 days, 52 cases were cured, 34 cases were improved, and the effective rate was 100%.

Discussion

Thoracic outlet syndrome (TOS) is a general term for a series of upper limb nerve and vascular symptoms caused by the compression of brachial plexus or subclavian artery or subclavian vein at the thoracic outlet for some reason. The main clinical manifestations include pain, numbness, weakness, and even muscular atrophy in the shoulder, arm and hand, cold and purpleness of the hand, and weakening or disappearance of radial artery pulsation [7]. Due to the mild symptoms of atypical thoracic outlet syndrome and few clinical specific examinations, most cervical magnetic resonance examinations indicated cervical spondylosis. In addition, many clinicians had insufficient understanding of this disease, and most of them were diagnosed as cervical spondylosis. Most patients in this group were diagnosed as cervical spondylosis at first, but the conservative treatment of cervical spondylosis was not effective. After treatment according to thoracic outlet syndrome, it was relieved and cured; Some patients were diagnosed after visiting the hand surgery department of a tertiary hospital. There are many characteristics in 86 patients with atypical thoracic outlet syndrome, which are summarized as follows in order to improve the understanding of this disease.

Etiology

Poor posture is the most common cause of atypical thoracic outlet syndrome. Most of the patients had humpback chest or/and were accompanied by anterior head/and scapular band drop. Typical "upper cross syndrome" posture; It can cause adaptive contraction of sternal muscle, pectoralis minor muscle and pectoralis major muscle, entrapment of brachial plexus nerve and compression of blood vessels. The head forward insertion can shorten the scalene muscle, narrow the scalene muscle space, compress brachial plexus nerve and compress blood vessels. Scapular band ptosis causes brachial plexus tension, costoclavicular space narrowing, subclavian muscle adaptive shortening, compression of brachial plexus and compression of blood vessels. Due to the different degrees of nerve and blood vessel compression, the corresponding symptoms are shown, because most patients with nerve and blood vessel compression is light, long fixed a position or sleep after the arm numbness, swelling pain, fist effort, arm cold and other symptoms, because the patient's symptoms are light and heavy, it is easy to miss.

Clinical Manifestations

The main clinical manifestations are numbness, distension and pain of shoulder, arm and hand; Most of the five fingers were numb or/and distended, and some patients showed numbness or/and distended pain in four or three fingers; Most of the patients had numbness, distension and pain of bilateral shoulder, arm and hand. In the morning, hand distension and pain, difficulty in making a fist, limited grasp of objects, and relief after activity. Most of the patients have worse symptoms after long hours of work or fatigue; Most patients get up in the morning hand pain, numbness is obvious, but reduced after activity. Some patients with 90 degree elbow flexion, at the same time abduction and rotation 90, the symptoms are aggravated, but some patients symptoms are alleviated. Symptoms may be aggravated with limited or excessive parietal movement.

Most of the patients had humpback chest or/and were accompanied by head forward/and shoulder band sag; Typical signs of "upper cross syndrome" may appear. Most patients have definite tender points in the scalene, pectoralis minor, pectoralis major and subclavian muscles, and pressing the tender points can induce or alleviate symptoms.

Most shoulder abduction tests can cause numbness, swelling pain and aggravation of shoulder, arm and hand. Some patients have acid distension and weakness. The muscle length test showed tension and contraction of the scalene, pectoralis minor and pectoralis major muscles.

Mild torticollis can be seen in patients with numbness, distention and pain of unilateral shoulder, arm and hand.

Most patients with atypical thoracic outlet syndrome have a history of high pillow sleep. No single nerve entrapment can explain the symptoms. Professor Gu Yudong's study showed that if the median nerve and ulnar nerve were damaged simultaneously without obvious cause (numbness of fingers 1-5, atrophy of thenar and interosseous muscles), the lower trunk of brachial plexus nerve should be considered as compression. However, the symptoms of atypical thoracic outlet syndrome are mild, with numbness and swelling of the fingers, difficulty in making a fist in the morning, and no muscular atrophy and abnormal sensory changes in the skin.

Diagnosis

There is no clear diagnostic criteria for atypical thoracic outlet syndrome, but preliminary diagnosis can be made based on medical history, clinical symptoms, tenderness point detection, muscle length detection, and special tests. However, due to the lack of understanding of clinicians, the first diagnosis is mostly cervical spondylosis. The best diagnostic method found in the clinic is experimental treatment, and the diagnosis can be confirmed if the symptoms improve after a single treatment. In this group, 66 patients were diagnosed with cervical spondylosis, 8 with coronary heart disease and 12 with thoracic outlet syndrome. All symptoms improved after single treatment, and atypical thoracic outlet syndrome was diagnosed after treatment.

Clinically, the following are found to be beneficial for the diagnosis of atypical thoracic outlet syndrome: A. Numbness and distending pain in one or both shoulders, arms and hands; B. Numbness and distending pain range can not be explained by a single nerve entrapment; C. Muscle tenderness points There are extensive tenderness points in the chest and back muscles, which are mainly distributed as follows: (1) pectoralis major, (2) pectoralis minor, (3) scalene, (4) subclavicular muscle, single muscle or multiple muscles; D. Muscle length detection muscle shortening: ① pectoral major muscle, ② pectoral minor muscle, ③ scalene muscle, single muscle or multiple muscles; E. Special tests: ① arm lift compression test, ② scalene muscle compression test, ③ costoclavicular joint test, ④ excessive abduction test, one or more of which are positive; F. A single trial treatment is effective.

Rehabilitation Treatment

Muscle massage technology can relax the stiff and short neck muscles and chest and back muscles, stretch the short muscles and relax the tense fascia, reduce local nerve and blood vessel compression, increase local blood circulation, accelerate metabolism, and relieve symptoms; The muscle drafting technique mainly stretches the scalene muscle, pectoralis major muscle, pectoralis minor muscle and other muscles with short adaptation, restores the initial length and flexibility of muscle fascia, and relieves local nerve and blood vessel compression; The technique of acromioclavicular joint loosening can increase the costoclavicular space and reduce local nerve and blood vessel entrapment. Strength training techniques can enhance and increase muscle strength and improve balance. The study found that the effectiveness of the first trial treatment was one of the key points of the diagnosis of this disease, so the symptoms of the patients in this group were significantly improved after 1-2 courses of treatment.

Prevention

Many bad postures, which are signs of slouching and lack of confidence, such as postures with hunchback or/and with head for-

ward/and shoulder strap drop, can lead to or aggravate atypical thoracic outlet syndrome. First of all, developing good posture is the best way to prevent atypical thoracic outlet syndrome. Avoid the "lazy" posture with chest, round shoulder and hunchback, improve the bad posture can enlarge the scalenes, costoclavicular space, pectoralis minor space and relax the brachial plexus nerve; Secondly, keeping the mobility of the shoulder joint is also a good measure to prevent atypical thoracic outlet syndrome, such as playing badminton or table tennis for 20-30 minutes every day. Finally, avoid working or studying in one position for long periods of time; With the progress of science and technology and the change of life style, many professional people who are accompanied by computers or mobile phones can not get proper rest in the face of computers and mobile phones for a long time, which is also one of the pathogenesis factors of atypical thoracic outlet syndrome. When working or studying for a long time, it is also a good measure to prevent atypical thoracic outlet syndrome to exercise the shoulder joints, elbow joints and hands every 20-30 minutes.

In short, atypical thoracic outlet syndrome is mostly caused by poor posture, resulting in local muscle adaptation shorten, and then narrow the scalene muscle space, costoclavicular space, pectoralis minor muscle space, compression of blood vessels and nerves to cause clinical symptoms, through soft tissue massage, muscle stretching and muscle strength training and other soft tissue balance techniques

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