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Research Article

Clinical Study of Acupotomy Trinity Lysis on Cervical Spondylotic Myelopathy with Liver and Kidney Deficiency Syndrome

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Abstract: ***Objective:*** To compare the therapeutic effects of acupotomy trinity lysis and traditional acupotomy on cervical spondylotic myelopathy. **Methods:** A total of 205 patients with cervical spondylotic myelopathy of liver and kidney deficiency syndrome were randomly divided into the experimental group (105 cases) and the control group (100 cases). The experimental group was relaxed with acupotomy in three positions: Heaven (tian), Human (ren) and Earth (di). Traditional acupotomy was used to relax Ashi acupoints of the affected vertebra in the control group. One treatment was conducted in one week, and the duration of one course of treatment was three weeks. The VAS, JOA score and NDI index were observed after treatment. ***Results:*** Before and after treatment, the total treatment efficiency of the treatment group was 95.23%, and that of the control group was 80.00%, there was significant difference between the two groups, $P<0.05$; Before operation, there was no significant difference in JOA score, NDI index score, and VAS score between the treatment group and the control group ($P>0.05$); there was no significant difference after 1 week ($P>0.05$), but there were significant differences between the two groups 2 weeks and 3 weeks after operation ($P<0.05$). ***Conclusion:*** Acupotomy trinity lysis is a safe, effective and economical treatment for cervical spondylotic myelopathy.

Key words: Acupotomy trinity lysis; Cervical spondylotic myelopathy; Liver and kidney deficiency; Clinical research

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1 Introduction

Cervical spondylotic myelopathy is caused by the degeneration of the cervical intervertebral disc tissues, which causes the changes in other structures of the cervical spine, such as herniated disc, osteophyte formation, articular process hypertrophy, ligamentum flavum hypertrophy, and lamina hypertrophy, and other clinical syndromes caused by spinal cord compression[1]. This disease is a common clinical disease and frequently-occurring disease. It is characterized by numbness of the limbs and movement difficulties, which cause serious impacts on the work and daily life of the patients. There are many clinical treatment methods. Among them, surgery is the best, but all surgeries are invasive, and the indications for surgery are limited, and they are not easily accepted by patients[2]. In recent years, with the continuous progress of acupotomy and the improvement of treatment technology, the application of acupotomy therapy for cervical spondylotic

myelopathy has been increasingly recognized by the majority of patients[3]. Traditional acupotomy treatment is mainly based on pressing tender points[4], and there are frequent shortcomings of ineffectiveness after acupotomy treatment, or high efficiency but low cure rate[5]. In this study, the acupotomy Trinity lysis therapy for treating cervical spondylotic myelopathy was created based on Professor Liu Fangming[6]'s principle of acupotomy lysis of cervical acupoints for the treatment for vertebral artery type cervical spondylosis, that is, to destroy the pathological framework of cervical spondylosis and restore the mechanical balance of the neck[5] by releasing the scars, contractures and adhesions of the soft tissues around specific acupoints on the whole spinal zone with acupotomy, which will gradually fill the fibrous annular fissure with granulation and fibrous tissue, and adjust the internal balance of the intervertebral disc, so as to reduce the compression of the cervical spinal cord, improve the blood supply to the spinal cord, and achieve the purpose of reducing clinical symptoms. This treatment scheme is suitable for the early and middle stages of cervical spondylotic myelopathy, and good clinical effects have also been achieved even in several patients who were preparing for surgery or suffer from postoperative recurrence, therefore it is worthy of clinical application.

1 Clinical Data

1.1 General Data

Cases in this study were selected from the inpatients at the Department of Acupuncture and Moxibustion of Binzhou Traditional Chinese Medicine Hospital from February 2016 to December 2019, where 205 patients with liver and kidney deficiency syndrome type cervical spondylotic myelopathy who met the inclusion criteria were admitted. The patients received acupotomy trinity lysis (experimental group, n=105) and traditional lysis of Ashi acupoints on the affected vertebrae (control group, n=100) respectively, of which there were 65 males and 40 females in the experimental group, aged 45-74 years old, on average (56.38±4.62) years old; control group consisted of 50 males and 50 females, aged 47-75 years old, on average (55.61±4.39) years old, there is no significant difference in the general data between the two groups (P>0.05).

1.2 Diagnostic Criteria

According to the "Criteria of Diagnosis and Therapeutic Effect of Diseases in Traditional Chinese Medicine"[7], there were typical clinical manifestations of cervical spondylotic myelopathy, as well as cases matching imaging examinations. Cervical spondylosis can be divided according to the syndromes: (1) wind-cold dampness; (2) stagnation of qi and blood stasis; (3) phlegm dampness blocking the collaterals (4) liver and kidney deficiency; (5) deficiency of qi and blood. This study mainly included patients with liver and kidney deficiency syndrome: clinical manifestations such as dizziness, headache, tinnitus and deafness, insomnia, numbness of the limbs, red eyes, red tongue and reduced salivation, and stringy narrow (xianxi) pulse, etc.

1.3 Inclusion Criteria

(1) Meet the above diagnostic criteria for cervical spondylotic myelopathy and the syndromatic diagnostic criteria for liver and kidney deficiency type cervical spondylosis.

(2) Age from 45 to 75 years old, regardless of gender.

(3) Participate voluntarily, obey the doctor's arrangement, and cooperate with treatment and follow-up.

(4) Patients' informed consent.

1.4 Exclusion Criteria

(1) Those who do not meet the above diagnostic criteria and inclusion criteria.

(2) Patients with cervical spine fractures, trauma, tuberculosis, other types of cervical spondylosis and shoulder tumors.

(3) Those whose symptoms were caused by medical diseases such as cerebrovascular disease.

(4) Patients with coagulation disorders such as anemia, thrombocytopenic purpura, hemophilia, etc.

(5) Pregnant or lactating women;

(6) Patients with severe primary diseases of endocrine, heart, liver and kidney, mental disorders and tumors etc.

2 Treatment Methods

2.1 Treatment Method of the Experimental Group

(1) Acupoint selection: refer to the seventh edition textbook of TCM Acupuncture and Moxibustion for

positioning: Heaven position (tianwei) – Naokong and Naohu acupoints; Human position (renwei) - Dazhui, Quyuan, and Tianzong acupoints; Earth position (diwei) - Ganshu, Shenshu, and the Ashi acupoints of the third lumbar vertebrae (Zhi Shi acupoints).

(2) Operation: In the sterile treatment room, the patient lies prone on the treatment bed, determine the acupoints and label, then routinely disinfects with 0.75% iodophor sterile cotton ball, and cover the body with sterile small-hole towel. Subcutaneous injection of 0.5ml of 1% lidocaine for local anesthesia, holding a type Ⅰ needle-knife, with the knife edge line parallel to the direction of the muscle, according to the four-step needle insertion acupotomy method, fully relax layer by layer, which can dredge the meridians and regulate the internal organs. During the treatment process, there will be local soreness, numbness, swelling, and electrified sensation, etc., and the treatment effect is better with radiating sensation at meridians on the lesions. The needle-knife was withdrawn, the puncture hole was pressed for 1 minute, and then covered with band-aid. After the operation, the patient was instructed to lie down for 40 minutes without touching water for 72 hours.

2.2 Treatment Method of the Control Group

(1) Acupoint Selection: Ashi acupoints, tender points beside the spinous process of the affected vertebrae.

(2) Operation: In the aseptic treatment room, the patient adopts the prone position, and the acupoints were labelled and sterilized. According to the four-step method, determine the acupoints and direction, then press and insert the needles. The needle-knife was withdrawn when the articular capsules of the affected vertebrae loosen; the remaining part of the operating procedure is the same as that of the experimental group.

Both groups were treated once a week, with 3 weeks as one course of treatment, and the curative effect was evaluated after one course of treatment had been completed.

2.3 Criteria of Treatment Efficiency Judgment

Refer to the "Criteria of Diagnosis and Treatment Efficiency for Diseases and Syndromes in Traditional Chinese Medicine" issued by the State Administration of Traditional Chinese Medicine in 1994[8]. Judgment of clinical efficiency: based on the improvement rate of symptoms. Cured: improvement rate ≥90%; markedly effective: improvement rate ≥75%, <90%; effective: improvement rate ≥30%, <75%; ineffective: improvement rate <30%.

The "Visual Analog Scoring Method" uses the VAS card produced by the Pain Medicine Society of the Chinese Medical Association. The higher the score, the greater the pain intensity.

Improvement of Neck Disability: The Neck Disability Index (NDI) questionnaire was used to evaluate the improvement of neck disability before and after acupotomy treatment. The lower the score, the better the improvement of neck disability.

2.4 Statistical Processing

The SPSS20.0 statistical software was used for data statistical analysis. Measurement data are expressed as mean ± standard deviation ($\bar{x} \pm s$). Quantitative data were compared by variance analysis, chi-square test should be used for inter-group count data comparison, and rank-sum test was used for ranked data comparison. $P<0.05$ is considered statistically significant, $P<0.01$ is considered prominently statistically significant.

3 Results

3.1 Comparison of Clinical Treatment Efficiency

The clinical treatment efficiencies of the two groups were compared. After treatment, the treatment efficiency of the experimental group was 95.23%, which is higher than 80.00% of the control group ($P<0.05$), see Table 1.

Table 1. Comparison of Clinical Treatment Efficiency between the Two Groups (*n*, %)

Group	*n*	Cured	Markedly Effective	Effective	Ineffective	Total Efficiency
Experimental	105	5	65	30	5	95.23%
Control	100	5	60	15	20	80.00%*

3.2 Comparison of VAS Scores between the Two Groups of Patients

Table 2. Comparison of VAS Scores between the Two Groups (n, $\bar{x} \pm s$)

Group	*n*	Before Surgery	1 Week after Surgery	2 Weeks after Surgery	3 Weeks after Surgery
Experimental	105	5.90±1.52	4.32±2.28	2.72±1.44	1.73±1.22
Control	100	6.03±1.60	4.68±2.54	3.78±1.81	2.10±1.52

In comparison between groups, the comparison of VAS scores between the two groups before surgery was not statistically significant. One week after operation, the VAS scores of the two groups were significantly reduced. The experimental group was slightly better than the control group. The difference between the groups was not statistically significant, $P>0.05$; 2 weeks after the operation, the VAS scores of the two groups were significantly reduced. The experimental group was better than the control group, and the inter-group comparison is statistically significant, $P<0.05$; 3 weeks after the operation, the experimental group was significantly better than the control group, and the comparison between the groups is statistically significant, $P<0.01$. Comparing different time points, the two groups were markedly statistically significant before and after operation, $P<0.01$.

3.2 Comparison of JOA Scores between the Two Groups of Patients

Table 3. Comparison of JOA Neurological Function Scores between the Two Groups (n, $\bar{x} \pm s$)

Group	*n*	Before Surgery	1 Week after Surgery	2 Weeks after Surgery	3 Weeks after Surgery
Experimental	105	9.35±1.27	12.62±1.46	13.52±2.34	14.16±3.15
Control	100	9.40±1.30	11.98±1.70	12.48±5.12	12.79±3.58

In comparison between groups, the comparison of JOA neurological function scores between the two groups before operation was not statistically significant. After 1 week, the JOA scores of the two groups improved, the experimental group was slightly better than the control group, the difference between the groups was not statistically significant, $P>0.05$; 2 weeks after the operation, the JOA scores of the two groups improved significantly, the test group Better than the control group, the inter-group comparison is not statistically significant, $P>0.05$; 3 weeks after the operation, the test group is better than the control group, and the comparison between the groups is statistically significant, $P<0.05$. Comparing different time points, the two groups were markedly statistically significant before and after operation, $P<0.01$.

3.3 Comparison of NDI Scores between the Two Groups of Patients

Table 4. Comparison of NDI Scores between the Two Groups (n, $\bar{x} \pm s$)

Group	*n*	Before Surgery	1 Week after Surgery	2 Weeks after Surgery	3 Weeks after Surgery
Experimental	105	39.65±9.50	17.62±4.28	15.52±3.34	12.16±3.05
Control	100	39.70±9.37	18.98±5.34	17.48±3.97	14.32±4.25

In comparison between groups, the NDI scores of the two groups of patients before operation were not statistically significant. One week after operation, the NDI scores of the two groups were improved, with the experimental group slightly better than the control group, the difference between the groups was not statistically significant, $P>0.05$; 2 weeks after the operation, the NDI scores of the two groups improved significantly, with the experimental group being better than the control group, the inter-group difference in comparison was not statistically significant, $P>0.05$; 3 weeks after the operation, the experimental group was better than the control group, the comparison between groups was not statistically significant, $P>0.05$. For comparisons between different time points, the two groups were markedly statistically significant before and after operation, $P<0.01$.

4 Discussions

Cervical spondylotic myelopathy accounts for 10% to 15% of cervical spondylosis. As the degenerative structure of the cervical spine compresses the

spinal cord, it is the most severe type of cervical spondylosis[9]. The symptoms are severe and the disability rate is high. It is unanimously agreed that cervical spondylotic myelopathy should be treated with surgery as soon as possible to avoid irreversible damage to the spinal cord and nerve tissues, but at the same time, it is also proposed that the surgical indications should be strictly controlled, and surgery should be performed under the premise that conservative treatment is ineffective[10]. There are many methods to treat cervical spondylotic myelopathy in traditional Chinese medicine, including internal treatment and external treatment. Practice and scientific research have proved that the curative effect of traditional Chinese medicine in the treatment of cervical spondylotic myelopathy is definitive, low cost, low risk, and easily accepted by patients. However, a standardized clinical treatment mode has not yet been established, which has greatly affected the development and innovation of traditional Chinese medicine treatment of cervical spondylotic myelopathy. Cervical spondylotic myelopathy is equivalent to the category of "arthralgia" and "flaccid paralysis" in traditional Chinese medicine. Its lesion is at the cervical spinal cord, which is attributed to neck injuries from overworking, plus externally infected pathogens, internal injuries in liver and kidney, bone marrow drying up and imbalance of blood and qi at the neck[11]. Chinese medicine treatment mainly focuses on tonifying liver and kidney, and nourishing tendons and bones. Currently, traditional conservative treatment methods such as acupuncture, massage, traction, and physiotherapy are not effective[12]. In recent years, with the development of acupotomy, acupotomy lysis has achieved good clinical effects in the treatment of cervical spondylotic myelopathy, that is, acupotomy lysis is performed on the upper and lower interspinous ligaments and the posterior joint capsules on both sides of the affected vertebrae. That is, by relaxing the local Ashi acupoints of the affected vertebrae, the internal and external balance of the cervical spine can be restored, the pressure on the cervical spinal cord can be relieved, the blood supply can be improved, and the clinical symptoms can be reduced. Since the treatment directly acts on the cervical spine and is carried out under blindsight, there are certain risks and difficulties in the treatment, which limits the clinical application and promotion of this technique.

The treatment of cervical spondylotic myelopathy with acupotomy trinity lysis is based on the characteristics and anatomy of the acupoints. The acupotomy is performed locally and as a whole, that is, the local area is mainly based on the cervical acupoints[13], and the distal end takes the spine as the center, where the Du Channel and Bladder Meridian acupoints were selected for treatment. Take Heaven positions (tianwei) - Naokong acupoints and Naohu acupoints; Human positions (renwei) - Dazhui acupoints, Quyuan acupoints, and Tianzong acupoints; Earth positions (diwei) - Ganshu, Shenshu, and Ashi acupoints of the third lumbar vertebra (Zhishi acupoints) as insertion points, penetrate deep into the bone surface for longitudinal dredging and peeling, and use 3-5 needle-knives for each acupoint to adjust the body's internal organs and meridians holistically, that is, "Trinity Lysis". The Naokong acupoint is the junction acupoint of Foot Shaoyang Meridian and Yangwei Meridian, which can relieve the gallbladder meridian, promote the clearing and ascension of yang, and smoothen the qi circulation. It is located at the upper attachment point of the atlantooccipital fascia. Naohu is the junction acupoint of the Du Channel and the Foot Taiyang Meridian, located in between the left and right occipital muscles. The subfascia is a branch of the greater occipital nerve, which can improve cervical spine flexion and head rotation. Tianzong is the meridian acupoint of Hand Taiyang meridian, which can relieve shoulder and back pain, numbness and radiating pain of upper limbs. Quyuan is the meridian acupoint of the Hand Taiyang Meridian. It is located at the attachment points of the trapezius muscle, rhomboid muscle and levator scapula. It can treat neck and shoulder discomfort. Dazhui acupoint is the junction acupoint of the Liuyang Meridians of the hands and feet and the Du Channel, located under the spinous process of the seventh cervical vertebra, which is linked to the Du Channel and can relieve neck pain and upper limb numbness and pain. The releasing of the acupoints at Heaven positions and Human positions plays a direct role in reducing compression of the spinal cord. Ganshu and Shenshu are acupoints of the bladder meridian, which can nourish the liver and kidney, relax the tendons and activate collaterals, improve the symptoms of patients' lower limbs and increase the long-term curative effects. The skin below Shenshu acupoint is thicker and the subcutaneous tissue is

denser. The deep structures include thoracolumbar fascia, erector spinae, quadratus lumbar muscles, and kidneys, etc.; below Ganshu acupoint are inferior trapezius, latissimus dorsi, and sacral spinous muscles, and the deep part of the acupoint corresponds to the pleural cavity. Therefore, too deep acupuncture can damage the kidneys, pleural cavity and other structures. In order to increase the safety factor, for those who are not skilled in the operation, the corresponding horizontally shift Jiaji acupoints can be relaxed.

5 Conclusions

Acupotomy trinity lysis for the treatment of liver and kidney deficiency type cervical spondylotic myelopathy is effective, safe, reliable, cost-saving, and repeatable. Compared with releasing the Ashi acupoints on the affected cervical vertebrae, working on Ashi acupoints around the neck and the third lumbar vertebrae, bladder meridian and other meridians simultaneously to avoid the high-risk parts of cervical vertebrae can reduce operation risk and difficulty, and achieve the purpose of treating both symptoms and root causes. It is relatively safer, easier to master, and easier to promote in clinical applications.

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