

# Effect of Dahuoluo Capsule Combined with Acupotomy on Improving Upper Limb Electromyography in Patients with Cervical Spondylotic Radiculopathy

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**Abstract: Objective:** To investigate the effect of Dahuoluo capsule combined with Acupotomy on improving upper limb electromyography in patients with cervical spondylotic radiculopathy. **Methods:** A total of 60 patients with cervical spondylotic radiculopathy in our hospital from January 2019 to June 2020 were selected and divided into two groups according to different treatment methods: control group (n = 30 cases, treated with Acupotomy); the study group (n = 30 cases, treated with Dahuoluo capsule combined with Acupotomy), the changes of F-wave conduction mode of upper limb median nerve and ulnar nerve were compared before and after treatment. **Results:** There was no significant difference in F-wave conduction velocity of median nerve and ulnar nerve between the study group and the control group before treatment ( $P > 0.05$ ). After treatment, the F-wave conduction velocity of EMG of anterior median nerve and ulnar nerve in the study group was significantly higher than that in the control group ( $P < 0.05$ ). **Conclusions:** Dahuoluo capsule combined with acupotomy can effectively improve the conduction velocity of median nerve and ulnar nerve in the compressed area, relieve or eliminate the compression state, which can be promoted.

**Keywords:** Dahuoluo capsule; Needle knife; Cervical spondylotic radiculopathy; Median nerve; Ulnar nerve; Electromyogram

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## 1. Introduction

Cervical spondylotic radiculopathy often occurs in people who work at their desks for a long time. In recent years, with the increase of people's life pressure, the incidence of cervical spondylotic radiculopathy is further increased, showing a trend of younger onset. The symptoms of nerve root are related to the formation of osteophyte at the posterior margin of vertebral body, protrusion and prolapse of nucleus pulposus, hypertrophy of posterior longitudinal ligament, hyperplasia of posterior facet joint and nerve adhesion. If the above signs are not corrected in time, it will lead to neck and shoulder pain, upper limb numbness and other symptoms, which will seriously affect the daily life of patients. Acupotomy is a common treatment for this disease, which has a significant effect in releasing soft tissue adhesion, but it fails to achieve the expected clinical purpose. Dahuoluo capsule is composed

of frankincense, angelica, *Atractylodes macrocephala* and red ginseng. It has the function of relaxing meridians and activating collaterals, and can be used in the treatment of cervical spondylosis. In this regard, this study, on the basis of acupotomy treatment, combined with Dahuoluo capsule treatment, discusses its curative effect on relieving the clinical symptoms of patients with cervical spondylotic radiculopathy<sup>[1]</sup>.

## 2. Object and Method

### 2.1 Object Information

A total of 60 patients with cervical spondylotic radiculopathy in our hospital from January 2019 to June 2020 were selected and divided into control group (n = 30, treated with Dahuoluo capsule) according to different treatment methods, including 18 males and 12 females. The mean age was ( $52.35 \pm 10.27$ ) years (range, 21-75 years); the course of disease ranged from 0.5 to 10 years,

with an average of  $(3.92 \pm 1.68)$  years. There were 19 males and 11 females in the study group ( $n = 30$ ). The mean age was  $(52.36 \pm 10.26)$  years (range, 20-74 years); the course of disease was 0.5-10 years, with an average of  $(3.75 \pm 1.74)$  years. The data of gender distribution, age and course of disease in different groups were compared ( $P > 0.05$ ), which suggested that statistical analysis could be carried out later. **Inclusion criteria:** The subjects met the diagnostic criteria of cervical spondylosis in the diagnostic criteria of TCM syndromes. Sufficient imaging data can be provided. They were 18-75 years old, informed of the study and signed informed consent. **Exclusion criteria:** Subjects did not tolerate the drug used in this study. Cervical spine with osteoporosis, osteoarthritis, tumor, fracture and dislocation. Those who do not tolerate acupuncture therapy. Severe neurosis was found. Patients with severe heart, liver, kidney, body and coagulation disorders. Those who failed to participate in the whole study<sup>[2]</sup>.

## 2.2 Method

### 2.2.1 Control Group

30 patients in the control group were treated with Acupotomy. Three sites were selected: C4-C7 posterior capsule, nape ligament and vertebral occipital muscle. The specific operation methods are as follows: guide the patient to prone position, pad a soft pillow under the chest to fully expose the neck and shoulder. Accurate positioning of the above three sites, and the application of iodophor routine disinfection, can carry out the needle knife release treatment. After wearing sterile gloves, the operator laid a sterile towel and applied 1% lidocaine for local anesthesia. After the anesthetic effect was achieved, the operation could be carried out according to the four step process of needle knife closed operation. When the needle knife is put in, in order to achieve the best loosening effect, the needle knife can be put in parallel along the muscle fiber, blood vessel and knife edge line. When releasing the joint capsule, the knife edge line is parallel to the longitudinal axis of the human body. Release the joint capsule first, release the muscle fascia, and control the puncture to the

bone surface at an angle of 45 degrees. Then 2-3 scalpels were removed along the articular surface. After treatment, the band aid was applied. When the insertion of the vertebral occipital muscle and the nuchal ligament is released, the needle knife is 45° to the sagittal axis of the human body and 45° to the foot side. The knife edge line is parallel to the longitudinal axis of the human body and perpendicular to the occipital bone.

Once a week for 3 weeks.

### 2.2.2 Research Group

On the basis of the control group, 30 patients in the study group took Dahuoluo capsule (Jiangxi Yaodu Zhangshu Pharmaceutical Co., Ltd; Approval number: z19990044; 25g/capsule). Take 1.0g once, 3 times a day, warm water after meal. The efficacy was compared after 3 weeks.

### 2.3 Observation Index

The changes of F-wave conduction velocity of median nerve and ulnar nerve were compared between the two groups. The above indexes were measured by electromyography (meb-7102k, provided by Japan photoelectric company) before treatment, and the F-wave conduction velocity of ulnar nerve wrist median nerve was calculated according to the formula.

### 2.4 Statistical Analysis

With the help of PEMs 3.2 statistical software, t-test was used to compare the measurement data between groups, the counting data were compared  $\chi^2$  test, significance level  $\alpha = 0.05$ .

## 3. Results

### Changes of EMG F-wave Conduction Velocity of Median Nerve and Ulnar Nerve in Upper Limb

There was no significant difference in F-wave velocity of median nerve and ulnar nerve between the study group and the control group before treatment ( $P > 0.05$ ). After treatment, the F-wave conduction velocity of EMG of anterior median nerve and ulnar nerve in the study group was significantly higher than that in the control group ( $P < 0.05$ ).

**Table 1.** Changes of F-wave conduction velocity of upper limb median nerve and ulnar nerve before and after treatment in two groups ( $\bar{x} \pm s$ , M/s)

Group	Median nerve		Ulnar nerve	
	Before treatment	After treatment	Before treatment	After treatment
Study group (n = 30)	51.36±9.57	59.95±10.88	52.02±9.84	60.85±11.23
Control group (n = 30)	51.64±10.62	54.23±9.25	51.87±9.13	54.97±10.46
<i>t</i>	0.107	2.194	0.061	2.099
<i>P</i>	0.985	0.032	0.951	0.040

#### 4. Discussion

Cervical spondylotic radiculopathy is a degenerative disease of cervical bone and its associated tissues. Imaging examination results show that the normal anatomical structure of the vertebral body changes, thus compressing the cervical nerve root, resulting in a series of cervical nerve compression symptoms, such as abnormal sensation, radiation or pressure pain symptoms. If the corrective treatment is not timely, the patient's condition may develop to the level of quadriplegia, and slowly reduce the quality of life of patients. Therefore, early systematic treatment of patients with cervical spondylotic radiculopathy symptoms, has a positive and important clinical significance.

Electromyography (EMG) is often used to detect the level of neuromuscular electrical activity when judging whether there is root damage in cervical spondylosis. In this study, we can evaluate the degree of nerve root damage by detecting the F-wave conduction velocity or EMG level and quantifying the detection index. This study showed that there was no significant difference in F-wave conduction velocity of median nerve and ulnar nerve between the study group and the control group before treatment ( $P > 0.05$ ). After treatment, the F-wave conduction velocity of EMG of anterior median nerve and ulnar nerve in the study group was significantly higher than that in the control group ( $P < 0.05$ ). The reason is that Acupotomy can release the compressed nerve root and the effect of Dahuoluo Capsule on dredging meridians and collaterals. Firstly, the effect of acupotomy was analyzed. The Acupotomy treatment scheme used in this study combined the mesh theory and the essence of acupotomy medical basic theory. The following effects can be achieved by loosening the C4-C7 posterior joint capsule, the starting and ending points of nuchal ligament, and the starting and ending points of vertebral occipital muscle: 1) activating the human neuroendocrine immune system: after the release of nerve compression state, the following effects can be achieved. It can stimulate the physiological mechanism of the above system, strengthen the production of analgesic substances, and achieve the analgesic effect<sup>[3]</sup>. 2) It can relieve muscle spasm: the effect of acupotomy is similar to acupuncture, and the acupuncture effect can directly act on the acupuncture site to promote capillary circulation and improve local microcirculation. The smooth operation of blood can also provide sufficient oxygen supply for muscle spasm, and effectively improve the performance of tissue hypoxia and ischemia. At the same time, it can reduce the production of inflammatory substances, promote the absorption of inflammatory sub-

stances, and ultimately relieve muscle spasm; 3) It can restore the dynamic balance of the neck: after the needle knife operation to release the soft tissue, it can effectively solve the stimulation and compression level of the soft tissue on the blood vessels and nerves, and restore the normal physiological function of the neck; 4) It can promote the recovery of neck biomechanical state: after the needle knife is effectively released, it can effectively mobilize its own body biomechanical regulation mechanism, which is conducive to the rapid outcome of clinical symptoms<sup>[4]</sup>.

However, clinical reports show that it is difficult to achieve satisfactory curative effect by using needle knife alone, and some patients are not admitted to hospital in strict accordance with the treatment process, which leads to the treatment effect difficult to meet the clinical requirements. Combined application of drug treatment can further improve the clinical curative effect. Dahuoluo capsule originated from experience prescription, written by Yao Jun, a medical scientist in Ming Dynasty. The composition of the prescription is borneol, clematis, Arianema, Radix Aconiti kusnezoffii, Notopterygii, Gastrodia elata, Rhizoma Cyperi, Agaricus, Radix Aucklandiae, radix paeoniae rubra, clove, cinnamon, asarum, Rhizoma Drynariae, Huoxiang, Kangxiang, frankincense, Pueraria, myrrh, Radix Saposhnikoviae, radix rehmanniae, Radix Polygoni Multiflori, Radix angelicae sinensis, scorpion, salamander, Bombyx batryticae, Radix Atractylodis Macrocephalae, radix rehmanniae, earthworm and Radix Aconiti, which is composed of licorice and other herbs. Under the coordination of various drugs, it can achieve the effects of dispelling wind and relieving pain, removing dampness and eliminating phlegm, relaxing tendons and activating collaterals, relieving swelling and relieving pain, dispersing stagnant fire, dredging orifices, dredging meridians, relieving exterior wind and expelling wind, overcoming dampness and stopping spasm, sedation and analgesia, dispelling wind and relieving pain, calming liver wind, regulating Qi and relieving depression, activating Qi and relieving pain, activating Qi and activating blood, reinforcing Yuanqi, reinforcing Qi and nourishing blood, removing turbidity and opening coagulation, ventilating blood, and removing deep hidden evil. Modern pharmacological studies show that Dahuoluo capsule has the following functions: (1) it can reduce the secretion of endothelin-1 by regulating the expression of procalcitonin gene, so as to promote the expansion of cerebral vessels; (2) It has neuroprotective effect: it can expand the basilar cervical blood vessels, increase the cerebral blood flow, provide sufficient oxygen for the cerebral nerve, and

relieve the cerebral blood supply deficiency caused by nerve root compression; (3) It has the effect of inhibiting platelet aggregation: by inhibiting platelet aggregation, it indirectly inhibits the process of inflammatory reaction, so as to reduce the tension of fascia, ligament and muscle caused by inflammatory reaction, and reduce the adhesion of soft tissue. In this study, the study group combined with Dahuoluo capsule treatment, compared with the control group, the change of nerve root conduction velocity was more significant. It is further confirmed that Dahuoluo capsule combined with Acupotomy can significantly relieve the symptoms of nerve root compression and improve the level of nerve conduction velocity<sup>[5,6]</sup>.

To sum up, Dahuoluo capsule combined with acupotomy can effectively improve the conduction velocity of median nerve and ulnar nerve in the compression part, relieve or eliminate the compression state in patients with cervical spondylotic radiculopathy, which can be promoted.

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