Case Reports

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Stellate ganglion block successfully relieved medically unexplained chronic pain: a case report

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Abstract

Medically unexplained symptoms refers to a clinical syndrome characterized by somatic symptoms that cannot be reasonably explained by any organic disease. Chronic pain can be a type of medically unexplained symptom. The current treatment modalities for chronic pain mainly include drugs and psychotherapy. The use of stellate ganglion block for treatment of chronic pain has rarely been reported. Herein, we report a patient whose chronic pain was completely relieved after receiving a stellate ganglion block.

Keywords

Stellate ganglion block, medically unexplained somatic symptom, chronic pain, pain relief, nerve blockade, case report

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Introduction

Medically unexplained symptoms (MUSs) are defined as somatic symptoms that cannot be reasonably explained by any organic disease. Patients with MUSs usually do not obtain symptom relief after repeated hospital visits and undergoing multiple investigations and/or treatments. This clinical syndrome can frustrate both the doctor and the patient and strain the doctor-patient relationship.[1] Chronic pain is a common type of MUS that is observed worldwide. Although chronic pain is a non-lethal disease, it can adversely affect the patient's normal life and work.[2]

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The conventional treatment methods for chronic pain include drugs and psychotherapy; however, a sizable proportion of patients with chronic pain show poor responses to active treatment. A stellate ganglion block can be an effective method for treatment of pain and anxiety.[3,4] However, no previous report has described the treatment of chronic pain associated with MUSs through stellate ganglion block; therefore, this report may assist physicians in clinical practice.

Case report

The reporting of this study conforms to the CARE guidelines.[5] The patient provided written informed consent for the publication of this case report and any accompanying images. A male patient in his early 50s sought medical advice because of recurrent migrating chest pain, upper limb pain, and headache for the previous 3 years. His symptoms had been aggravated for the previous 2 weeks. The pain was worsened by poor sleep and constipation. Over the past 3 years, the patient had visited the psychological, neurology, and pain departments of many hospitals. Computed tomography of the head, chest, and both upper limbs showed no abnormality; moreover, no abnormalities were detected on cardiac color Doppler ultrasound and an electrocardiogram. Laboratory indices such as rheumatic factor, rheumatoid factor, erythrocyte sedimentation rate, C-reactive protein, uric acid, routine blood tests, and liver and kidney function tests were also normal. The final diagnosis was somatoform disorder and pain with no obvious cause. Subsequently, the patient received psychological counseling in the psychology department. Moreover, he had been taking 0.5 mg mecobalamin, oryzanol (30 mg, three times per day), and diclofenac sodium double-release enteric-coated capsules (75 mg, once a day) for 3 years. However, the migratory pain symptoms were not relieved. A detailed medical history obtained after admission revealed no history of trauma or stress because of interpersonal relationships in the family or financial constraints. His visual analog scale score was 6, and his Hamilton Anxiety Scale score was 13.

On physical examination, his vital signs were normal. There was no obvious developmental abnormality, and his nutritional status was satisfactory. His mental faculties were normal, and no sensorimotor deficit was present. A general examination of the head and cervicothoracic and abdominal segments showed no abnormalities. There was no deformity of the limbs or spine. No tenderness was observed over the cervical or thoracic spine. His physiological reflexes were normal, and no pathological reflexes were elicited. The nature of the pain was migratory with paroxysmal tingling. The pain increased on touch and pressure; there was no effect on motor function at the onset of pain (visual analog scale score: 6). In summary, we considered that the chronic pain may be related to autonomic dysfunction. Therefore, we recommended stellate ganglion blockade. After obtaining the patient's written informed consent for treatment, ultrasound-guided stellate ganglion block was performed using 0.16% ropivacaine in the neck (Figure 1), once a day. Because stellate ganglion block therapy is an invasive treatment method, to minimize tissue damage and facilitate repair of the damaged muscles and fascia, we decided to perform the therapy by alternating administration to the left and right side of the neck. After three treatment sessions, the pain was alleviated, and the patient stopped taking all medications. After the fifth treatment, the pain was obviously relieved. After a total of nine treatment sessions

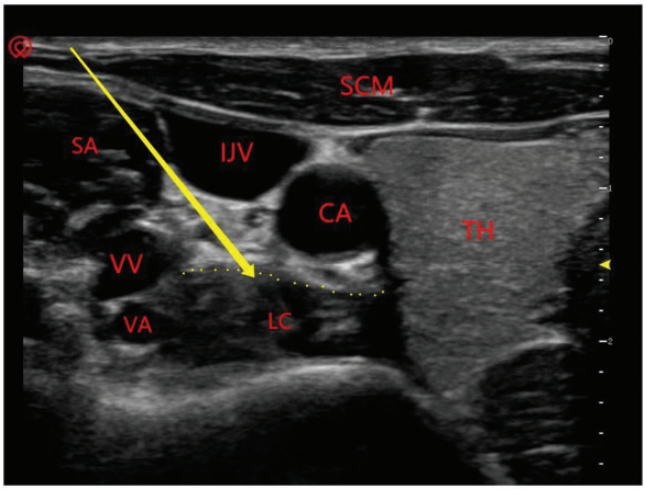

Figure 1. Stellate ganglion block site under ultrasound guidance.
SCM: sternocleidomastoid muscle; TH: thyroid; CA: carotid artery; IJV: internal jugular vein; VV: vertebral vein; VA: vertebral artery; LC: longus colli; SA: scalenus anterior.
The yellow arrow represents the direction and depth of the needle.
The yellow dotted line represents the lamina profunda fasciae colli.

Table 1. Treatment schedule.

Total treatment duration (days)	Number of treatments for left SGB	Number of treatments for right SGB
9	5	4

SGB, stellate ganglion block.

(Table 1), with clinical manifestations of Horner's syndrome every time, the patient showed complete resolution of pain (Table 2). As of the 3-month follow-up, there has been no recurrence of pain.

Discussion

In clinical practice, physicians occasionally encounter patients suffering from multiple somatic symptoms for which no obvious cause can be found by routine investigations. This syndrome is usually referred to as medically unexplained somatic

Table 2. Treatment-induced temporal changes in outcome measures.

Time point	Painful area	VAS score	HAMA score
First day	Chest	6	13
After day 1	Head	4	13
After day 2	Upper limb	4	12
After day 3	Chest	2	10
After day 4	/	0	8
After day 7	/	0	7
After day 13	/	0	7
After day 27	/	0	6
After day 35	/	0	6

VAS, visual analog scale; HAMA, Hamilton Anxiety Scale.

symptoms. Patients with MUSs may present with a diverse range of symptoms, including gastrointestinal symptoms, pain, and fatigue; in severe cases, there may be difficulty in walking or lack of sensation.[6] These patients typically seek treatment at different hospitals and in various disciplines and are often diagnosed with different disorders, such as somatoform disorders, anxiety, conversion disorders, chronic fatigue syndrome, atypical facial pain, headache, shoulder pain, and chest pain. In the current case, the chief complaint was pain, presenting as migratory pain in the chest, head, and upper extremities. The patient had visited many hospitals and undergone several investigations, but the cause of the pain could not be found. In addition, the pain did not respond to neurotrophic agents, analgesics, or psychological guidance, which was a cause of distress for the patient and his family. MUSs can lead to costly medical expenses and wasting of medical resources.[7]

The treatment of MUSs mainly depends on psychotherapy, which is based on establishing good communication with the patient and obtaining a detailed understanding of the patient's personality, life environment, and emotions. According to the standard therapeutic guidelines, cognitive behavioral therapy can be used to improve a patient's cognition and lifestyle habits. Some studies have demonstrated the efficacy of psychotherapy and cognitive therapy.[8] Furthermore, pharmacotherapy should be administered if patients have anxiety or depression. In the present case, although the patient received psychotherapy and symptomatic drug therapy, his Hamilton Anxiety Scale score was 13, indicating no relief of anxiety. This may be because the patient only received psychotherapy without antidepressant treatment. After 3 years of neurotrophic therapy, analgesic therapy, and psychological counseling, the migratory pain still persisted. This prompted us to consider a different treatment method. Stellate ganglion block has a regulatory effect on neurological dysfunction and has been shown to be effective in relieving insomnia, anxiety, affective disorders, and pain.[4,9] Furthermore, it is a first-line, minimally invasive treatment for complex regional pain syndrome.[10] Therefore, we speculated that stellate ganglion block may help relieve MUSs.

The nature of the pain treated by stellate ganglion block in this case was different from that in previous reports. In most patients treated with stellate ganglion block, the pain was localized to a single site, and the main cause of the pain was relatively clear.[3,10] However, in our patient, there was no clear cause of pain, and the pain was migratory in nature. Fortunately, this patient showed a good response to stellate ganglion block. Previous studies have shown that stellate ganglion block has an inhibitory effect on the sympathetic nerves,[11] restores sympathetic-vagal balance, reduces the blood concentration of norepinephrine, inhibits the production of inflammatory mediators,[12] and accelerates the metabolism of nocicogenic substances such as serotonin.[13] Another previous study indicated that repeated stellate ganglion block therapy may be effective in regulating nerves and reducing sympathetic nerve activity.[14] We speculated that the good therapeutic effect of stellate ganglion block in our patient may be related to these mechanisms.

Conclusion

We report a patient with unexplained migratory pain as a clinical manifestation of an MUS. Stellate ganglion block achieved a relatively good treatment effect. We plan to conduct a multi-center, multidisciplinary study to further confirm the therapeutic effect and to clarify the rationale for the use of stellate ganglion block for the treatment of pain as a manifestation of MUSs.

Author contributions

YNZ conceived the case report; YTH and YNZ analyzed the data and drafted the manuscript. QYL, ZMZ, and JX participated in the treatment of the patient. YTH and YNZ critically revised the manuscript and contributed substantially to the discussion section.
All authors read and approved the final manuscript.

Ethics statement

This study was approved for publication by the Ethics Committee and Institutional Review Board of the Third Affiliated Hospital of Sun Yat-Sen University-Yuedong Hospital. All patient details are de-identified.

Declaration of competing interest

The authors declare that they have no conflicts of interest concerning this article.

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References

1. Johansen ML and Risor MB. What is the problem with medically unexplained symptoms for GPs? A meta-synthesis of qualitative studies. *Patient Educ Couns* 2017; 100: 647–654.
2. Ciaramella A, Gmsso S, Poli P, et al. When pain is not fully explained by organic lesion: a psychiatric perspective on chronic pain patients. *Eur J Pain* 2004; 8: 13–22.
3. Hironobu Ueshima. A successful case of stellate ganglion block for difficult therapy of refractory tension headache. *J Clin Anesth* 2019; 54: 149.
4. Xu Y and Zhang Y. Treatment of multiple physiological and psychological disorders in one patient with stellate ganglion block: a case report. *J Int Med Res* 2021; 49: 1–5.
5. Gagnier JJ, Kienle G, Altman DG, et al; CARE Group. The CARE guidelines: consensus-based clinical case reporting guideline development. *Headache* 2013; 53: 1541–1547.
6. Toonders SAJ, van Westrienen PE, Konings S, et al. Patients' perspectives on the usability of a blended approach to an integrated intervention for patients with medically unexplained physical symptoms: mixed methods study. *J Med Internet Res* 2021; 23: 1–13.
7. Husain M and Chalder T. Medically unexplained symptoms: assessment and management. *Clin Med (Lond)* 2021; 21: 13–18.
8. Scott MJ, Crawford JS, Geraghty KJ, et al. The 'medically unexplained symptoms' syndrome concept and the cognitive-behavioural treatment model. *J Health Psychol* 2022; 27: 3–8.
9. Olmsted KLR, Bartoszek M, Mulvaney S, et al. Effect of stellate ganglion block treatment on posttraumatic stress disorder symptoms: a randomized clinical trial. *JAMA Psychiatry* 2020; 77: 130–138.
10. Wie C, Gupta R, Maloney J, et al. Interventional modalities to treat complex regional pain syndrome. *Curr Pain Headache Rep* 2021; 25: 1–6.
11. Davis J, Ozcan MS, Kamdar JK, et al. Stellate ganglion block used to treat reversible cerebral vasoconstriction syndrome. *Reg Anesth Pain Med* 2021; 46: 732–734.
12. Zhu G, Kang Z, Chen Y, et al. Ultrasound-guided stellate ganglion block alleviates stress responses and promotes recovery of gastrointestinal function in patients. *Dig Liver Dis* 2021; 53: 1–6.
13. Gupta MM, Bithal PK, Dash HH, et al. Effects of stellate ganglion block on cerebral haemodynamics as assessed by transcranial Doppler ultrasonography. *Br J Anaesth* 2005; 95: 669–673.
14. Smith DI, Jones C, Morris GK, et al. Trial ultrasound-guided continuous left stellate ganglion blockade before surgical gangliolysis in a patient with a left ventricular assist device and intractable ventricular tachycardia: a pain control application to a complex hemodynamic condition. *ASAIO J*. 2015; 61: 104–106.