

CASE REPORT

An acute spinal epidural hematoma after acupuncture combined with dyspnea, dysarthria, bradycardia and hypothermia—a case report

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Abstract

Spinal epidural hemorrhage (EDH) after acupuncture is a rare disease and needs to be differentiated from stroke because it presents neurological deficits such as motor weakness. A 48-year-old patient taking anticoagulants developed posterior neck pain and progressive quadriplegia immediately after acupuncture. Upon arrival to the emergency room (ER), he complained of dyspnea, dysarthria, bradycardia, and hypothermia. Diffuse spinal EDH findings on spinal magnetic resonance imaging (MRI) were confirmed, and posterior decompression was performed emergently. The patient is currently recovering. Since dyspnea, dysarthria, bradycardia, and hypothermia complained of by this patient are not common symptoms of spinal cord injury, emergency medicine doctors should be careful not to miss the spinal cord injury through detailed history-taking and additional neurologic exam.

Keywords

Spinal epidural hemorrhage; Spinal epidural hematoma; Dyspnea; Dysarthria; Bradycardia; Hypothermia; Acupuncture

1. Introduction

Spinal EDH is a rare disease first reported by Jackson [1, 2] in 1869. According to Newton *et al.* [3] 40~60% of spinal EDH are idiopathic and others are attributable to a variety of factors including hemophilia, hypertension, and arteriovenous malformation. Spinal EDH can also arise after spine surgery and neuraxial anesthesia due to epidural venous plexus trauma by a needle or catheter. Rarely, acupuncture has been implicated [3]. According to Domenicucci *et al.* [4], 11.2% of spinal EDH is caused by spinal puncture, mainly for diagnostic or therapeutic practices and spinal anesthesia. Due to the nature of the spinal puncture, lumbar or thoracolumbar damage is common (61%) [4].

Acupuncture is an alternative medicine derived from traditional Chinese medicine. It can be defined as the practice of inserting one or more needles into specific sites on the body surface for therapeutic purposes [5]. Although definite acupuncture indications remain unexplored, acupuncturists argue that it is effective as a symptomatic treatment of lower back pain, depression, anxiety, headache, arthritis, allergies, general pain, female infertility, insomnia, neck pain and frozen shoulder [6]. It remains controversial how acupuncture works [7]. Acupuncture can cause a variety of complications, usually mild and transient [8], and very rarely severe complications, one of which is spinal EDH.

2. Case report

A 48-year-old male was admitted to an emergency room with dysarthria and right-sided weakness 3 hours post acupuncture. Since the patient's job involved excessive physical activity, he developed a lot of muscle pain after work and said that he received acupuncture to relieve the pain. Duration of acupuncture was unknown, but treated areas included posterior of the neck and back. 5 minutes after removal of the needle, persistent posterior neck pain and numbness of the right hand and foot occurred. Subsequently, the patient was admitted to the emergency room. The patient had well-controlled hypertension and no specific another disease than coronary artery disease 1 year ago, for which aspirin and clopidogrel were administered after cardiac stents. During physical examination upon emergency department (ED) admission, the patient was conscious. Patient complained left-side weakness while right-side was normal. On physical examination, motor weakness was observed that involved a movement of only the left toes. Hypoesthesia was found in both lower extremities. Dysarthria and mild dyspnea were observed. Hence, brain computed tomography (CT) scan was performed under the suspected diagnosis of stroke, which showed no specific findings. Shortly after the CT scan, respiratory distress symptoms worsened, and a repeat physical examination showed that both upper and lower extremities motor grade were 0 with paresthesia and the trunk below C3 level exhibiting hypoesthesia. There was no

rectal tone, urination was impossible, and bowel sounds were reduced. Mild ecchymosis was also observed in the posterior of the neck and lumbar region. Vital signs measured in the emergency room showed bradycardia with a heart rate of 35–49 beats/min, and a body temperature of 35.1 °C, suggesting hypothermia. Blood tests did not reveal any specific findings. Full-spine MRI revealed right posterior epidural hematoma at the C2–C4 level, cord compression with myelopathy at the C3–C4 level, and syringomyelia at the C6 level (Fig. 1). Emergency surgery was performed for cord decompression, and steroids were administered concurrently. After 2 months of hospitalization, the patient was discharged while maintaining rehabilitation with left upper motor grade 4, left lower motor grade 5, and the right upper and lower extremities of grade 4.

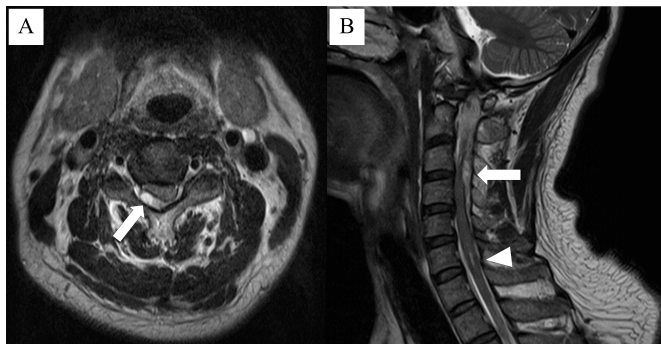


FIGURE 1. T2-weighted image of axial and sagittal cervical spine magnetic resonance imaging (MRI). A. Right posterior epidural hematoma at C3 level (arrow). B. Epidural hematoma at C2–C4 level (arrow) and syringomyelia at C6 level (arrowhead).

3. Discussion

According to Woo *et al.* [9], the use of traditional Chinese medicine for therapeutic purpose is gradually increasing in Korea, and 95.3% of patients visit hospitals for acupuncture therapy. Although the safety of acupuncture is controversial, Witt *et al.* [10] concluded that acupuncture was relatively safe through a prospective observational study of 229,230 patients. On the contrary, a systematic review study by Chan *et al.* [11] stated that although rare, there exist serious complications in acupuncture related to mortality, and should be carefully considered. In this case, immediately after the acupuncture therapy, symptoms of unilateral weakness and dysarthria occurred relatively quickly, and the symptoms worsened owing to quadriplegia in a short time, suggesting the possibility of stroke and spinal cord injury at the same time. The patient presented with hypothermia, bradycardia, and dyspnea 30 minutes post-admission. Patients with quadriplegia after spinal cord injury have severe thermoregulation dysfunction [12]. When the upper vertebral level of the spinal cord is injured, those patients cannot detect thermal changes, and most of them tend to lose hypothalamic control and exhibit poor vasomotor response. In addition, muscle shivering to generate heat cannot occur at a lower body temperature. According to Khan *et al.* [12] 66% of patients with chronic spinal cord injury exhibiting quadriplegia or paraplegia showed a

lower body temperature than normal. In this case, the patient showed hypothermia with exacerbation of motor weakness; therefore, warming was performed. Cardiovascular instability is a common complication in upper thoracic or cervical cord injury. Although cardiac sympathetic innervation originating from T1–T4 is blocked by the injury, parasympathetic fibers innervating the heart through the vagus nerve remain intact, leading to bradycardia and decreased myocardial contractility [13, 14]. This patient did not show hypotension, but the heart rate decreased to 30 beats/min. Patient complained of dyspnea due to motor weakness in ascending progression. Initially after admission, the patient complained of dysarthria, but no dysarthria-related lesions were observed on brain CT and MRI. Post-recovery examination revealed a difficulty in pronunciations from dyspnea with no specific symptoms of dysarthria. The patient particularly complained of mobility restriction of the diaphragm, which seems to have caused dyspnea due to a decrease in tidal volume and vital capacity [15]. The phrenic nerve is responsible for mobility of the diaphragm, is located at C3–C5 level and is associated with the spinal cord injury at C2–C4. Unilateral weakness strongly suspects a stroke, but a neurological examination should be repeated if the neurological symptoms are rapidly progressing, especially if the cognitive function is preserved. The possibility of spinal cord injury should also be ruled out. Further, aside from brain lesions, the possibility of spinal injuries causing bradycardia, hypothermia, and dyspnea should be considered along with spinal EDH as a differential diagnosis when acupuncture is performed, as in the case of this patient. Spinal EDH symptoms may be mild or severe, depending on the compression of the nervous system, the degree of neurovascular ischemia, and the toxicity of the hemolytic products. The greater the initial neurological defect, the poorer the prognosis [4]. Thus, surgical intervention should be performed promptly in these cases. Therefore, spinal EDH should always be included in the differential diagnosis of stroke. It should be confirmed through history-taking and re-evaluation, depending upon the progression of symptoms.

AVAILABILITY OF DATA AND MATERIALS

The data presented in this study are available on reasonable request from the corresponding author.

AUTHOR CONTRIBUTIONS

YHC—designed the research study. YC—performed the research, analyzed the data, wrote the manuscript. All authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the institutional review board (IRB) of Ewha Womans’ University Mokdong hospital (IRB No. 2023-02-018), and informed consent was waived by the IRB because the study was retrospective nature and patient information was anonymized before the analysis.

ACKNOWLEDGMENT

Not applicable.

FUNDING

This research received no external funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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How to cite this article: Yunhyung Choi, Yoon Hee Choi. An acute spinal epidural hematoma after acupuncture combined with dyspnea, dysarthria, bradycardia and hypothermia—a case report. *Signa Vitae*. 2024; 20(2): 102–104. doi: 10.22514/sv.2024.020.