Bilateral tension pneumothorax related to acupuncture

Rumi Tagami, Takashi Moriya, Kosaku Kinoshita, Katsuhisa Tanjoh

ABSTRACT
We report on a patient with a rare case of bilateral tension pneumothorax that occurred after acupuncture. A 69-year-old large-bodied man, who otherwise had no risk factors for spontaneous pneumothorax, presented with chest pressure, cold sweats and shortness of breath. Immediately after bilateral pneumothorax had been identified on a chest radiograph in the emergency room, his blood pressure and percutaneous oxygen saturation suddenly decreased to 78 mm Hg and 86%, respectively. We confirmed deterioration in his cardiopulmonary status and diagnosed bilateral tension pneumothorax. We punctured his chest bilaterally and inserted chest tubes for drainage. His vital signs promptly recovered. After the bilateral puncture and drainage, we learnt that he had been treated with acupuncture on his upper back. We finally diagnosed a bilateral tension pneumothorax based on the symptoms that appeared 8 h after the acupuncture. Because the patient had no risk factors for spontaneous pneumothorax, no alternative diagnosis was proposed. We recommend that patients receiving acupuncture around the chest wall must be adequately informed of the possibility of complications and expected symptoms, as a definitive diagnosis can be difficult without complete information.

INTRODUCTION
Acupuncture has become one of the most popular alternative treatments worldwide for a variety of illnesses.1–3 A number of published reports describe adverse effects such as the occurrence of pain at the site of needling, tiredness, bleeding4 and a feeling of faintness.5 Pneumothorax can occur during acupuncture if the needle goes through the visceral pleura and allows a sufficient amount of air to enter the thorax. Although this is one of the most well-described complications of acupuncture, as far as we know the incidence of acupuncture-related pneumothorax is only 0.0014%,6 and there are few reports of deaths with this procedure.6 7 The interval from acupuncture to the onset of symptoms of pneumothorax is short, with symptoms usually presenting immediately after treatment.6 8 In the case described here, the patient developed bilateral tension pneumothorax a full 8 h after treatment, demonstrating the need for greater awareness of such complications.

This study was approved by the ethics committee of our hospital, the Nihon University School of Medicine, Itabashi Hospital of Tokyo, Japan.

CASE REPORT
A 69-year-old man became aware of chest pressure and had sudden pain in his upper back and tiredness after dinner. He presented with cold sweats and shortness of breath and was transferred to our hospital. His weight and height were 71 kg and 159 cm, respectively, and body mass index 28.0. His consciousness was normal, blood pressure was 150/82 mm Hg, pulse rate 122 beats/min and respiratory rate 28 breaths/min. Percutaneous oxygen saturation was 97% with oxygen delivered at 6 l/min through a mask. On visual inspection, we did not suspect trauma. Furthermore, physical examination showed only slight bilateral hypophonesis. The patient had no relevant past medical history. From the above-mentioned findings, we ordered a chest x-ray examination, electrocardiography and biochemical examination of his blood. We suspected an endogenous disease, such as ischaemic heart disease (figure 1).

Immediately after finding evidence of bilateral pneumothorax on his chest radiograph, the patient suddenly complained of severe dyspnoea. His percutaneous oxygen saturation decreased to 86% (with oxygen delivered at 6 l/min through a mask). His blood pressure decreased to 78/68 mm Hg, with cold sweat and
moisture mainly on his antebrachial region and palms. His jugular veins were distended. When his pulse rate decreased to 52 beats/min and respiratory rate increased to 42 breaths/min, he became disoriented. We quickly performed a bilateral thoracic puncture at the second intercostal space on the mid-clavicular line and applied continuous thoracic bilateral drainage at the fifth intercostal space on the mid-axillary line to treat the tension pneumothorax. We could hear air leaving through the punctures. The patient’s symptoms and vital signs suddenly improved.

After this treatment, we learnt that he had been treated twice previously for chronic pain in the cervical, thoracic and lumbar regions of the spine using acupuncture bilaterally, both in the paravertebral area and close to the medial border of the scapula. The second treatment had been given earlier that day and required the use of several needles with a diameter of 0.20 mm and a length of 70 mm in the lumbar region and 20–40 mm in the thorax. He recovered and was discharged on the eighth day of hospitalisation.

DISCUSSION
Our patient showed no sign of injury to the surface of his body, but he developed bilateral tension pneumothorax. He complained of chest pain and only later did we learn that acupuncture had been performed on his back on the same day that symptoms began. The time interval between acupuncture and the onset of symptoms of pneumothorax, which usually occur immediately after acupuncture or within a few hours, was over 8 h in this case. We obtained information about the treatment from the acupuncturist. Because the needles he used were the typical thin needles used by most acupuncturists, we speculated that the pneumothorax had gradually enlarged over a period of time. The tension pneumothorax developed when one-way inflow allowed air into the pleural space during inspiration but no outflow during expiration.

Bilateral tension pneumothorax is most often associated with spontaneous, subpleural bleb rupture, inheritable disorders including cystic fibrosis and Marfan syndrome, tumours, trauma and barotrauma. The clinical diagnosis of tension pneumothorax is not based on the degree of collapse on a chest radiograph but rather on the physiological findings and signs that indicate rapid deterioration due to impaired venous return, reduced cardiac output and hypoxaemia. In this case, when the patient came to the outpatient department, his morbid condition did not yet indicate tension pneumothorax. However, his condition deteriorated to bilateral tension pneumothorax immediately after examination of the chest radiograph. We believe this condition was caused by the acupuncture for the following reasons. First, the patient received acupuncture bilaterally and bilateral tension pneumothorax emerged several hours later. Second, he had no risk factors for spontaneous pneumothorax, such as physical features, a history of smoking or a familial history of inheritable disorders. Third, we found no tumour or bleb on chest CT. After considering the differential diagnosis, we finally identified his condition as bilateral tension pneumothorax secondary to acupuncture.

Finally, we were reminded of the importance of informed consent, which should include details of the interval from treatment to the appearance of symptoms and on the nature of possible symptoms. If acupuncturists explain to patients that it can take over 8 h for presentation of tension pneumothorax symptoms, faster diagnosis might be possible.

CONCLUSION
The time interval between acupuncture and complicating pneumothorax can be delayed and some deaths have been reported. It is necessary to adequately inform patients of the possibility of complications and possible symptoms.

Contributors Conception and design, or analysis and interpretation of data: RT, drafting the article or revising it critically for important intellectual content: RT, TM, KK and KT and final approval of the version to be published: RT, TM, KK and KT.

Competing interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

Patient consent Obtained.
**Case report**

**Ethics approval** Ethics committee of the Nichidai University Itabashi Hospital.

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*Acupunct Med* 2013 31: 242-244 originally published online February 28, 2013
doi: 10.1136/acupmed-2012-010284

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