Bilateral tension pneumothorax after acupuncture

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SUMMARY

Acupuncture is an ancient complementary medicine which is currently used worldwide. Many serious adverse events have been reported which include a spectrum of mild-to-fatal complications. However, the level of awareness with regard to complications is still low both to physicians and patients. We report a 63-year-old who presented with acute shortness of breath 2 hours after having had acupuncture. On examination, there was absent breath sound heard on the left lung and slightly reduced breath sound on the right lung. She had type 1 respiratory failure. Urgent chest radiograph confirmed bilateral pneumothorax which was more severe on the left with tension pneumothorax and mediastinal shift. Chest tubes were inserted bilaterally after failed needle aspiration attempts. Subsequently, the pneumothoraces resolved, and she was discharged well. The bilateral pneumothoraces caused by acupuncture were curable but could have been potentially fatal if diagnosis was delayed. This case report adds to the limited current literature on the complications of acupuncture leading to bilateral pneumothoraces.

BACKGROUND

Acupuncture is a common complementary medicine for chronic pain which has been popular in many countries predominantly among the Chinese. It is used for many types of disorders although the evidence base for clinical efficacy is largely limited to neck and back pain. Cochrane data may suggest positive efficacy towards prophylaxis to migraine headache and episodic or chronic tension-type headache.^{1,2} Due to its common prescription including for approved and non-approved indications, the awareness for safety issues needs to be addressed further. Wide array of complications may occur from mild such as pain and bruises to more serious complications such as pneumothorax, cardiac tamponade, spinal cord trauma, subarachnoid bleeding, organ perforations and even death.^{3,4} The complications related to trauma is invariably due to the topography of needling sites.⁵

Serious and possible fatal acupuncture-related complications are rarely reported; therefore, any incident of such occurrence in a widely acceptable practice should be reported. We report this case to increase the awareness that such a rare adverse event can still occur and not negligible in acupuncture.

CASE PRESENTATION

A 63-year-old Chinese woman with no significant medical history presented to emergency department with sudden onset of breathlessness. She has had an acupuncture for the first time due to her chronic back and neck pain in the morning prior to

the development of her symptoms. She had no fever, cough and haemoptysis and did not report recent strenuous exercise or travelling. She was a lifelong non-smoker.

She passively informed at presentation that the acupuncturist made multiple needle insertions at different sites on her upper back and neck. A few punctures were described as more painful than the others especially the ones under the scapular region. However, as this was her first time undergoing acupuncture, she did not acknowledge that the problem could arise from the puncture.

She was petite with a body mass index of 20.5. Her oxygen saturation on admission was 88% on room air.

Respiratory rate was 22 breaths/min but other vital signs were normal. The neck veins were dilated, and the trachea was deviated to the right side; however, there was no cyanosis. There was no needle mark or bruises seen on the skin over her back. On specific physical examination, there were hyper-resonance percussion together with reduced breath sounds predominantly on the left lung. Cardiovascular examination revealed abnormal position of the apex beat as well. Her oxygen saturation increased to 100% with 15 L via 60% face mask.

INVESTIGATIONS

Urgent chest radiograph showed bilateral pneumothoraces worse on the left side (figure 1). Initial full blood counts showed normal white cell counts of $8 \times 10^9/L$, haemoglobin (Hb) of 11.4 g/dL with haematocrit (HCT) of 38% and platelet of $188 \times 10^9/L$.

Table 1 showed serial blood investigations before and after the chest drainage. The Hb dropped by almost 3 g/dL due to traumatic haemothorax after chest drain insertion. Arterial blood gas on admission also showed type 1 respiratory failure with respiratory alkalosis which was subsequently normalised with 15 L oxygen via 60% face mask.

Subsequently, a CT of the thorax with contrast showed the pneumothoraces bilaterally with collapsed lungs and a haemothorax (Hounsfield Unit 20).

A repeat chest radiograph after drainage showed full lung expansion on both sides.

DIFFERENTIAL DIAGNOSIS

The diagnosis of iatrogenic haemopneumothorax in this case was quite clear due to the temporal relationship with regard to the recent acupuncture. However, these differentials may also be considered:

- Haemothorax secondary to traumatic either from acupuncture or from vascular laceration during chest tube insertion.

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Figure 1 (A) Bilateral pneumothorax with total collapse of left lung and mediastinal shift to the right. (B) Bilateral chest drained in-situ, evidence of blunted bilateral costophrenic angle on the left. (C) Resolutions of bilateral haemopneumothorax prior to discharge.

- ▶ Spontaneous primary pneumothorax.
- ▶ Secondary pneumothorax due to underlying chronic lung disease.
- ▶ Parapneumonic effusion.

TREATMENT

On presentation, the patient was given high-dose oxygen via face mask. Chest drainage were inserted into both hemithoraces using 24Fr intercostal catheter in the fifth intercostal space at the midaxillary line which were connected to underwater seal. Her breathlessness improved after chest drainage. The chest tube was oscillating with tidal breathing with evidence of air leak initially. A cumulative total of 350 cc and 470cc bloody fluid drained from the left and right pleural space, respectively.

She was also transfused with 1 pint (250cc) of packed cells on day 2 of admission.

OUTCOME AND FOLLOW-UP

There was bloody fluid which drained out (analysis showed HCT >50% of serum) which was consistent with haemothorax. Subsequently after a few days, the fluid became less haemorrhagic and resolved. Nevertheless, there was persistent air leak

on the right lung after 72 hours on chest drainage. We initiated a low-pressure suction ($-10 \text{ cmH}_2\text{O}$) to help expand the right lung. The suction was used with caution to avoid worsening air leak. We also referred to our cardiothoracic surgeons but fortunately she did not require any surgery. CT thorax confirmed there was no evidence of bronchopleural fistula or underlying lung parenchymal structural damage.

She had a prolonged stay because of delayed right lung expansion. There was no evidence of secondary infection. After a total of 5 days, both of her lungs expanded. The left chest drain was dislodged, but the right chest drain was successfully removed. She was asymptomatic after the event and discharged well.

We have informed her regarding the possible adverse events following acupuncture. She was also advised to visit a professional or accredited acupuncturists in the future should she consider for this alternative therapy again.

DISCUSSION

There are many acupuncture services available in Malaysia, and are popularly sought by the Chinese populations compared with other races. Acupuncturist in Malaysia comprise those approved by the local ministry of health as well as who do not. The advertisements for this therapy are widely available and accessible. Inevitably acupuncture-naïve patients would visit random therapists without credentialing and this may pose higher risk for adverse events to these consumers.

Many adverse events associated with acupuncture had been described in the literature. Complications include mild such as pain and bruises to more serious complications such as pneumothorax, cardiac tamponade, spinal cord trauma, subarachnoid bleeding, organ perforations and even death.^{3,4} The complications related to trauma is invariably due to the topography of needling sites.⁵

We report this case to increase the awareness that such a rare adverse event can still occur and not negligible in this widely practised therapy. Thus, appropriate measures must be taken during needle handling especially at more vulnerable acupoints, such as the subscapular region as described in our patient. Anatomically the lung parenchymal surface is around 1–2 cm from the skin surface in the region of the medial scapula.⁶ As a result from improper needle insertion or manipulations around the area, this may cause haemothorax, pneumothorax or both. The risk may be reduced if the acupuncturist is more familiar with the anatomy of the human body and using standardised and prudent methods during needle handling.

The pathophysiology of haemopneumothorax in this case is mainly due to trauma following the needle insertion into the chest

Table 1 Serial relevant blood investigation during hospital stay

	On admission	After chest tubes	After PC transfusion	Before discharge
WCC	$8.0 \times 10^9/\text{L}$	$9.2 \times 10^9/\text{L}$	$6.5 \times 10^9/\text{L}$	
Hb	11.4 g/dL	8.6 g/dL	10.3 g/dL	
Platelet	$188 \times 10^9/\text{L}$	$205 \times 10^9/\text{L}$	$212 \times 10^9/\text{L}$	
HCT	38%	28.7%	34.3%	
Urea (mmol/L)	5.4			
Creatinine (mmol/L)	83			
aPTT	45.5 s			
INR	1.01			
	Under room air	Under 15 L/min 60%	Under 3 L/min	Under room air
pH	7.50	7.38	7.35	7.36
pO_2 (mm Hg)	56.5	182	83	78
pCO_2 (mm Hg)	21	35	32	25
SO_2	86.7%	100%	98%	96%
HCO_3 (mmol/L)	20	22	25	21

aPTT, activated partial thromboplastin time; Hb, haemoglobin; HCT, haematocrit; INR, international normalised ratio; PC, packed cells; WCC, white cell count.

wall and the lung parenchyma which might have traumatised the vascular bundle.⁷ These cause air leak and blood to ooze into the pleural cavity. The diagnosis of haemothorax was concluded using the measurement of the pleural fluid HCT which was more than 50% of blood.⁸

The thin body habitus was a possible risk factor for our patient, in addition with improper needle insertion which resulted in pneumothorax. As a conclusion, it is very prudent for clinicians to understand the pathophysiology and risk factors for adverse events after acupuncture. It may help us deliver appropriate advice and information for the patient opting complementary medicines such as acupuncture.

We suggest that any patient who has dyspnoea, chest pain or interscapular pain following needle insertion during acupuncture to thoracic area should always be suspected for haemothorax, pneumothorax or both. A low index of suspicion and early detection of these serious and potentially fatal complications may lead to successful treatment and save lives.

Learning points

- ▶ Adverse events following acupuncture are rare but not negligible.
- ▶ Some of the complications may be very serious and fatal.
- ▶ Chest drain alone without thoracoscopy can be a successful treatment for pneumothorax.
- ▶ Haemothorax may occur directly because of acupuncture or during chest drain insertion.
- ▶ Timely diagnosis and urgent treatment for each complication may halt clinical deterioration.

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