Bilateral Pneumothorax Following Acupuncture in a Healthy Young Athlete: The First Reported Case from Oman

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Abstract

Acupuncture, a central practice of Traditional Chinese Medicine, is globally recognized as a safe complementary therapy. However, serious complications, though rare, can occur—most notably pneumothorax resulting from inadvertent pleural penetration during thoracic needling. Bilateral pneumothorax is exceptionally uncommon but can be life-threatening if not promptly recognized and treated. We report a case of bilateral acupuncture-induced pneumothorax in a 19-year-old previously healthy female athlete from Oman—the first such case documented in the country. The patient presented with acute right-sided chest pain and dyspnea approximately 24 hours after receiving thoracic acupuncture. Examination revealed tachycardia, tachypnea, and reduced right-sided air entry. Chest radiography confirmed a large right pneumothorax requiring needle decompression followed by chest drain insertion. No persistent air leak was observed following chest tube placement. Subsequent imaging demonstrated a new left-sided pneumothorax, necessitating a second chest drain. High-resolution CT confirmed bilateral pneumothoraces without evidence of structural lung disease. The patient was managed conservatively with bilateral chest tubes, oxygen therapy, and physiotherapy, achieving full recovery. This case highlights that acupuncture, while generally safe, can cause severe thoracic complications even in young, healthy individuals without predisposing factors. The patient's athletic build and low body mass index likely reduced the skin-to-pleura distance, increasing the risk of pleural injury at thoracic acupoints such as BL13–15 and SI11. Practitioners must maintain vigilance, employ anatomical precision, and educate patients about post-procedural warning signs. For emergency clinicians, a recent history of acupuncture should prompt suspicion for pneumothorax in any patient presenting with chest pain or dyspnea.

Keywords: Acupuncture Complications, Bilateral Pneumothorax, Iatrogenic Injury, Traditional Chinese Medicine, Chest Drain Management, Thoracic Acupuncture.

Introduction

Acupuncture, rooted in Traditional Chinese Medicine (TCM), is a widely practiced complementary and alternative therapy that has become increasingly popular worldwide.[1] Although often regarded as a safe intervention, serious adverse events have been reported in the literature.[2] A primary concern among these complications is iatrogenic pneumothorax, which results from inadvertent pleural penetration during thoracic needling.[2,3] Indeed, Chinese literature reviews have frequently cited pneumothorax as the most common adverse outcome associated with acupuncture.[2,4] However, incidence of acupuncture-related pneumothorax is statistically rare, estimated in large prospective studies to be less than 1 case per 1 million procedures.[4,5] Furthermore, because symptoms may be insidious or delayed, presenting minutes to hours after the procedure, this complication is often under-recognized by acupuncturists and emergency personnel.[1,4] A pneumothorax is potentially life-threatening and can quickly progress to cardiovascular compromise, necessitating immediate identification and intervention.[2,4,5]Bilateral pneumothorax following acupuncture, while significantly rarer than

unilateral presentation, has been documented in case reports globally. Risk factors predisposing a patient to pneumothorax include underlying pulmonary conditions (such as smoking or bullae formation), patient body habitus (low body mass index or decreased subcutaneous fat), and the use of thoracic acupoints (such as BL 13–15 or SI 11).[4-6] Early recognition and proper counselling of patients regarding symptoms like chest pain and dyspnea are essential for ensuring a positive patient outcome.

This report describes a case of bilateral pneumothorax following acupuncture treatment in a patient in Oman. This case is significant as it represents, to the best of our knowledge, the first such reported incident from the Sultanate of Oman. This documentation reinforces the necessity for all practitioners to maintain a high level of vigilance regarding this potentially serious complication.

Case Report

A 19-year-old previously healthy female athlete with the Oman Sports Federation presented to the Emergency Department with acute right-sided chest pain and shortness of breath following Chinese acupuncture therapy performed the previous day. She was alert and oriented, with vital signs showing tachycardia (HR 110 bpm) and tachypnea (RR 22/min), though she remained hemodynamically stable. Physical examination revealed decreased right-sided chest expansion and reduced air entry. Before obtaining imaging, differential diagnoses included primary spontaneous pneumothorax, pulmonary embolism, musculoskeletal chest pain, and acute pericarditis; however, given the temporal association with thoracic acupuncture, iatrogenic pneumothorax was strongly suspected. Chest radiograph demonstrated a large right-sided pneumothorax with partial lung collapse.(Figure 1a) Emergency needle decompression was performed, followed by insertion of a right-sided intercostal chest drain (ICD). Post-procedural imaging confirmed appropriate tube placement, though a residual pneumothorax persisted.(Figure 1a, 1b, 1c) During inpatient observation, approximately 18 hours later, repeat imaging revealed a new left-sided pneumothorax. (Figure 1b) A second ICD was inserted on the left side, and the patient remained stable without respiratory compromise.(Figure 1c) No persistent air leak was detected from either chest tube following initial decompression. High-resolution chest CT confirmed left apical and medial pneumothorax with a small pleural effusion, along with residual right apical pneumothorax, and no evidence of underlying lung pathology.(Figure 1b) CT was obtained to exclude underlying structural lung pathology and to ensure complete lung re-expansion prior to chest tube removal. She was managed conservatively with bilateral chest drains, supplemental oxygen, analgesia, and respiratory physiotherapy. Respiratory physiotherapy included supervised deep breathing exercises, thoracic expansion manoeuvres, supported coughing techniques, and early mobilization in addition to incentive spirometry. The patient improved steadily, with full re-expansion of both lungs (Figure 1d). The right ICD remained in situ for five days and the left for four days; both were removed after complete radiological resolution and absence of air leak for more than 24 hours. She was discharged in stable condition with outpatient follow-up arranged.

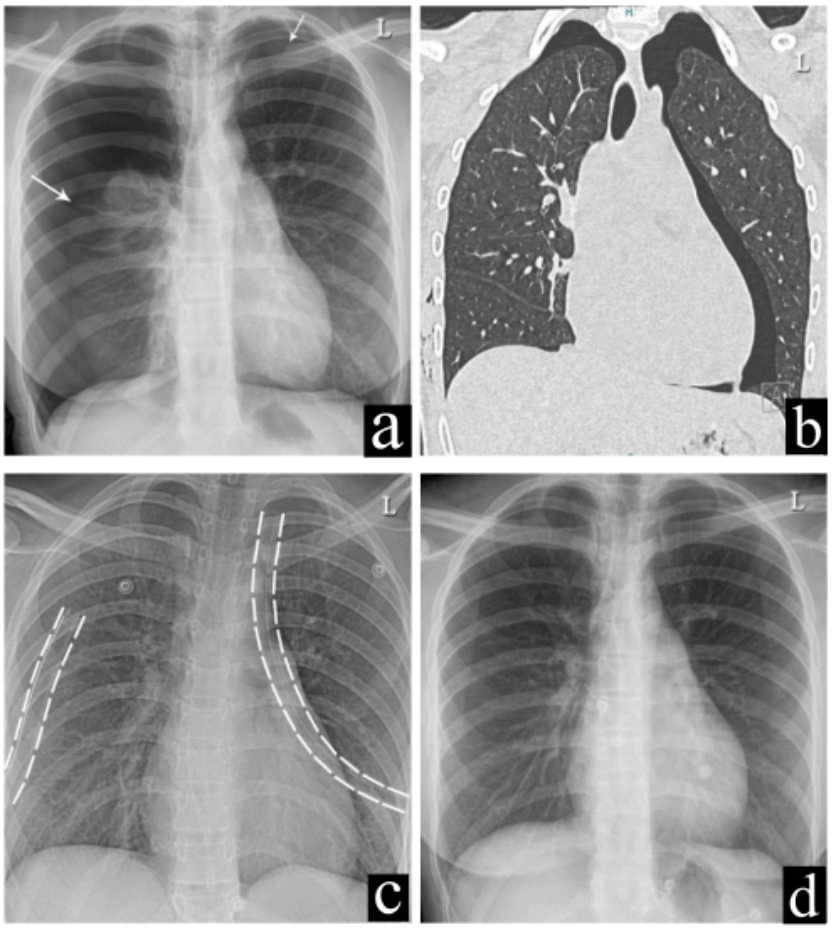

Figure 1: Chest imaging demonstrating bilateral pneumothorax following acupuncture and subsequent recovery. **(a).** Post-acupuncture chest radiograph showing bilateral visible pleural lines (annotated arrows) and absence of peripheral lung markings, consistent with bilateral pneumothoraces. The right lung is nearly completely collapsed. No diaphragmatic flattening or mediastinal shift is evident. (b). Coronal CT chest image (lung window) demonstrating bilateral pneumothoraces with well-defined visceral pleural lines and air in the pleural spaces. Note iatrogenic subcutaneous emphysema along the right lateral chest wall related to chest tube insertion (chest tube not in field of view). **(c)** Chest radiograph after bilateral intercostal drain (outlined with dashed lines) insertion showing near-complete resolution of bilateral pneumothoraces with re-expansion of partially collapsed lungs. **(d)** Follow-up chest radiograph after removal of both intercostal drains demonstrating full re-expansion of both lungs with complete resolution of the pneumothoraces.

Discussion

This case of a 19-year-old female athlete developing bilateral pneumothorax following acupuncture draws attention to a rare but potentially life-threatening complication of a therapy widely regarded as safe and minimally invasive. Acupuncture, rooted in traditional Chinese medicine and now practiced globally, involves the insertion of fine needles into specific anatomical points to alleviate various conditions ranging from musculoskeletal pain to stress and fatigue. Its safety profile is generally excellent, with adverse events typically limited to mild, transient effects such as local bruising, dizziness, or discomfort.[2,7,8] However, serious complications—though statistically rare—have been documented, particularly when acupuncture involves deep needling in anatomically vulnerable areas such as the thorax.[2] Among these, pneumothorax remains the most frequently reported serious adverse event, with the risk predominantly associated with needle insertion over paraspinal and scapular regions where lung tissue lies close to the surface.[3-5]

The acupuncture needles reportedly used were disposable stainless-steel filiform needles measuring approximately 0.25 mm in diameter and 40 mm in length, featuring a solid tapered shaft and sharp beveled tip.

Although significantly thinner than lung biopsy needles, acupuncture needles are inserted without imaging guidance and lack calibrated depth-control mechanisms. In lean individuals, where the skin-to-pleura distance over thoracic acupoints may measure as little as 20–22 mm, even a standard 40 mm needle inserted perpendicularly can penetrate the pleural cavity. In contrast, lung biopsy needles are advanced under radiological visualization with controlled depth adjustment, thereby minimizing inadvertent pleural injury. In this case, the patient received thoracic acupuncture and presented the next day with pleuritic chest pain and shortness of breath. Clinical evaluation revealed tachycardia and tachypnea, and imaging confirmed bilateral pneumothoraces —a rare outcome that required urgent decompression and bilateral chest drain insertion, followed by further intervention due to recurrence on the right side. What makes this case particularly notable is the absence of traditional risk factors: the patient was a non-smoker, had no underlying pulmonary disease on CT imaging, and had no known prior medical history.[6] The bilateral pneumothoraces are therefore most likely iatrogenic, attributable to pleural puncture during acupuncture. A key contributing factor appears to be the patient's athletic build and likely low body mass index (BMI), which may have significantly reduced the depth from skin to pleura, especially over common thoracic acupoints such as BL13–15 (along the Bladder meridian) or SI11 (on the scapular region), which are often targeted for back pain and respiratory issues.[9] Studies have shown that in lean individuals, the pleura may lie just 20–22 mm below the skin surface in these areas, increasing the risk of inadvertent lung injury with standard needling techniques.[10] Symptoms such as dyspnea or chest pain may emerge hours after treatment and can be misinterpreted by both patients and practitioners as expected post-treatment responses.[3-5] In some instances, patients are advised to rest or wait, delaying potentially life-saving care. From a clinical perspective, this case reinforces the need for acupuncturists to receive rigorous training not only in traditional techniques but also in applied anatomy, risk stratification, and patient education. For emergency physicians, it is essential to maintain a high index of suspicion for acupuncture-related pneumothorax in any patient presenting with respiratory symptoms and a recent history of needling, regardless of initial severity. Overall, while acupuncture remains a valuable therapeutic modality, this case reminds us that it is not without risk—and that vigilance, anatomical precision, and prompt recognition are essential to prevent and manage rare but serious complications.

Conclusion

The documentation of this case, representing a serious complication in a previously healthy young athlete from Oman, reinforces the global need for adherence to safety standards and robust communication to manage and prevent acupuncture-related morbidity.

Disclosure

This case report adheres to the CARE (Case Report) guidelines. Patient consent was not obtained because no identifiable or sensitive personal information has been included. Only anonymized radiological images are presented, and although every effort was made to remove any potential identifiers, absolute anonymization cannot be fully guaranteed.

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