



Massive air in the heart complicating percutaneous lung biopsy

Jiaxin Li¹, Zhimei He², Xin Ouyang² and Chunbo Chen^{2*} 

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A 50-year-old woman was admitted to ICU with a 3-month history of fever, cough, and progressive shortness of breath. She was intubated and mechanically ventilated. A central venous catheter was placed in the right internal jugular vein. After the failure of anti-infective and anti-rheumatic therapy, CT-guided percutaneous lung needle biopsy was performed to establish a pathological diagnosis. Shortly after the procedure, the patient developed dyspnea, hemoptysis, extensive subcutaneous emphysema, and ultimately cardiopulmonary arrest. Cardiopulmonary resuscitation was promptly performed, and an effective heartbeat was transiently restored. Immediate chest CT showed extensive subcutaneous emphysema and right-sided pneumothorax, as

well as massive air in the right heart and venous circulation (Fig. 1). Emergency needle thoracentesis was done. Unfortunately, the patient deteriorated rapidly and died 58 min after the procedure. Lung biopsy under mechanical ventilation with positive end expiratory pressure is the main cause of the pneumothorax, subcutaneous emphysema, and air embolism in this case. Other risk factors include chest compression and loose subcutaneous tissue. The air embolism might originate from pneumothorax and travel to the right heart and venous circulation through the subcutaneous fistulae along the central venous catheter under positive pressure. Ventilated patients with high-risk factors should be alert to this rare but fatal complication.

*Correspondence: gghccm@163.com

² Department of Critical Care Medicine, Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences, 106 Zhongshan Er Road, Guangzhou 510080, Guangdong, People's Republic of China
Full author information is available at the end of the article

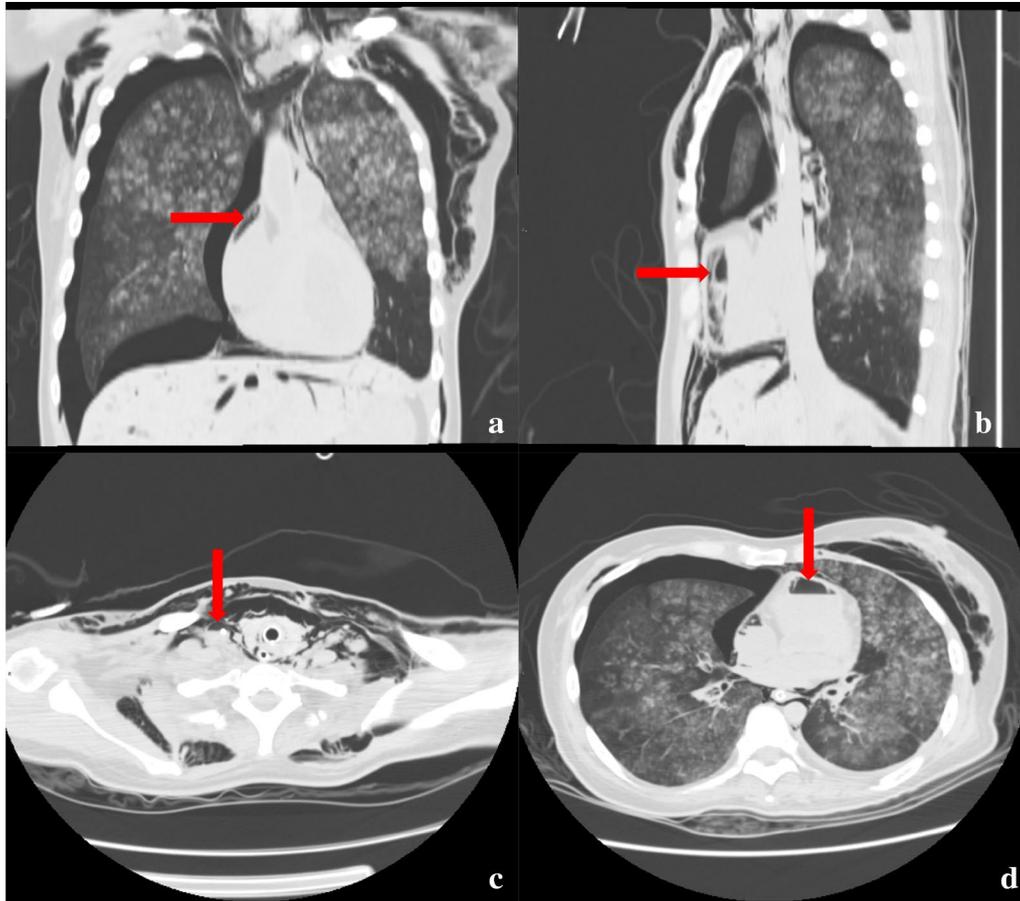


Fig. 1 **a** Constructed coronal section of chest CT demonstrated pneumothorax, subcutaneous emphysema, and air embolism in bilateral innominate veins, right subclavian vein, hepatic vein, mediastinum, and the right auricle (arrow). **b** Sagittal section of chest CT demonstrated pneumothorax, subcutaneous emphysema, and air embolism in the right ventricle (arrow). **c** Transverse section of chest CT demonstrated air embolism in the superior vena cava and the central venous catheter (arrow). **d** Transverse section of chest CT demonstrated air embolism in right auricle and right ventricle (arrow)

Author details

¹ Department of Intensive Care Unit of Cardiac Surgery, Guangdong Cardiovascular Institute, Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences, 106 Zhongshan Er Road, Guangzhou 510080, Guangdong, People's Republic of China. ² Department of Critical Care Medicine, Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences, 106 Zhongshan Er Road, Guangzhou 510080, Guangdong, People's Republic of China.

Conflicts of interest

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Ethical standards

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