A 59-year-old male with lung adenocarcinoma was presented to the emergency department with temporary loss of consciousness, right upper quadrant pain, progressive dyspnea, and cough. He was afebrile; blood pressure was 107/56 mmHg, heart rate 118 beats/min, respiratory rate 24 breaths/min, and oxygen saturation on room air was 94%. On physical examination, there were no respiratory sounds in the right hemithorax. Chest x-ray showed total opacification of
the right hemithorax with a mediastinal shift (Figure 1). Contrast-enhanced computed tomography (CT) of the chest revealed a necrotic mass in the right upper lung lobe and massive right pleural effusion, causing total atelectasis in the right lung, shifting the mediastinum to the left, and compressing superior vena cava, consistent with tension hydrothorax. In addition, due to massive right pleural effusion, CT showed that the liver had shifted to the lower and midline of the abdomen (Figure 2). A chest tube was placed, and 1000 ml of hemorrhagic fluid was drained. Then the chest tube was clamped to prevent pulmonary reexpansion edema. Following drainage, the patient’s respiratory distress and right upper quadrant pain decreased. The pleural fluid analysis resulted in exudate type fluid which contains fibrin, blood elements, and malignant cells. He was discharged on the tenth day of hospitalization, and pleurodesis was planned.

Up to 2/3 of cancer patients develop pleural effusion at some stage of their disease, which is associated with poor prognosis and lower life expectancy, especially in lung adenocarcinoma (1). Almost 70% of exudative pleural effusions are secondary to malignancy and pleural infections, and these two are also the most common causes of tension hydrothorax (2, 3). The pathophysiology of malignant tension hydrothorax is associated with the affected large pleural surface, obstruction of lymphatic drainage, and low serum oncotic pressure (1, 2). Patients with massive pleural effusion rarely present with tamponade-like symptoms and tension hydrothorax (1, 3). Tension hydrothorax is a life-threatening condition that requires urgent treatment and needs to be recognized. Patients with tension hydrothorax usually present to the emergency department with symptoms secondary to progressive dyspnea and hypotension (1-3). The chest x-ray is used as an initial diagnostic tool, and CT can confirm the diagnosis. Moreover, CT can
demonstrate the underlying cause of tension hydrothorax and related complications (2). Recognition of the imaging findings is essential for radiologists and clinicians to diagnose and provide adequate treatment.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Conflict of Interest: The authors have no conflict of interest to declare.

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References


Figure Legends

Figure 1: Posteroanterior chest x-ray shows total opacification of the right hemithorax with a mediastinal shift (arrowheads).

Figure 2: A) Axial chest CT image shows massive right pleural effusion that compresses superior vena cava and right atrium (white arrowhead). B) Volume-rendered three-dimensional reconstruction from chest CT shows massive right pleural effusion (arrowheads) that compresses diaphragm and liver (arrows). C) Coronal chest CT image shows a necrotic mass in the right upper lung lobe (white arrowhead) and massive right pleural effusion.
A rare cause of severe dyspnea and right upper quadrant pain: Tension hydrothorax.
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