"PEek-a-boo!" pulmonary embolus visualized by endobronchial ultrasound

Ricardo H Franco MD

CASE

A 59-year-old man was transferred from an outside facility for a higher level of care due to bilateral pulmonary emboli (PE) and an apical thrombus. At the time of his presentation, the patient complained of shortness of breath but conveyed no past medical history besides palpitations and previous alcohol abuse. Computed tomography of the thorax with chest angiography revealed bilateral pulmonary emboli with bilateral hilar masses (Figure 1). The pulmonology service was consulted to evaluate the patient for possible malignancy and perform biopsies of mentioned hilar masses. Bronchoscopy and endobronchial ultrasound (EBUS) with fine needle aspiration were performed. While performing a mediastinal inspection with EBUS, we could visualize the thrombus in the right pulmonary artery at the level of the right bronchus intermedius (Figure 2). The imaging demonstrated the direct visualization of a pulmonary embolus in the pulmonary arteries by EBUS.

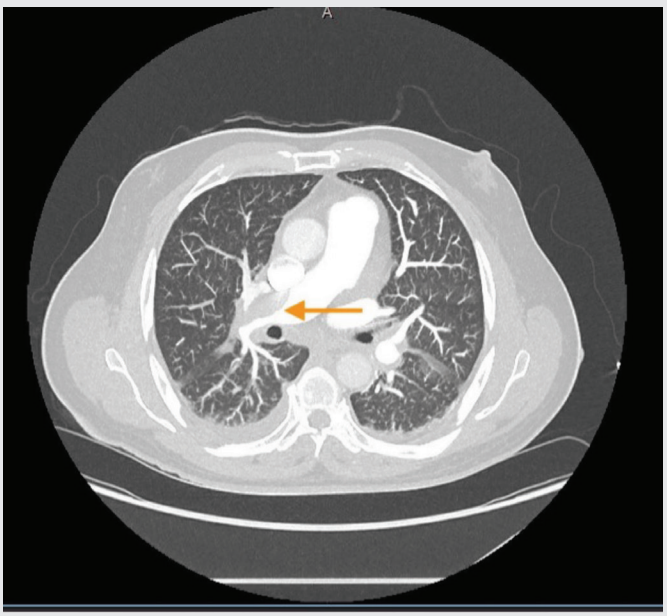

Figure 1. CT Angiography with an arrow indicating a pulmonary artery thrombus at the right bronchus intermedius level.

DISCUSSION

Pulmonary emboli (PE) are life-threatening, difficult to diagnose, and sometimes fatal.[1] Its prevalence in hospitalized patients is about 1%, with some diagnosed post-mortem at autopsy.[2] The Centers for Disease Control and Prevention estimates that 900,000 people are affected by venous thromboembolisms each year, with a quarter of patients presenting with sudden death as their first symptom of PE.[3] The best imaging modality to identify pulmonary emboli is computed tomography pulmonary angiography, which remains the gold standard. However, some critically ill patients or patients with contraindications to contrast or radiation cannot undergo this imaging, further complicating their care.[4]

Corresponding author: **Ricardo Franco**
Contact Information: Ricardo.Franco@ttuhsc.edu
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Endobronchial ultrasound has been used to visualize and sample mediastinal lymph nodes and pulmonary nodules since its introduction into pulmonary medicine. EBUS has allowed physicians to identify thrombi in the pulmonary vasculature.

Our case further demonstrates the use of EBUS to identify pulmonary emboli. It is not a new Gold Standard, but its use can guide treatment decisions. This is especially true in patients unable to undergo CT imaging due to instability, pregnancy, or contraindication to contrast.[5] Endobronchial ultrasound has also been used to help differentiate between obstructive or distributive shock secondary to sepsis. Channick and Channick reported a patient who presented in shock with an ECHO concerning for thrombus in transit. Endobronchial ultrasound was used to evaluate the pulmonary vasculature and noted that the central pulmonary arteries were free from thrombi, and the

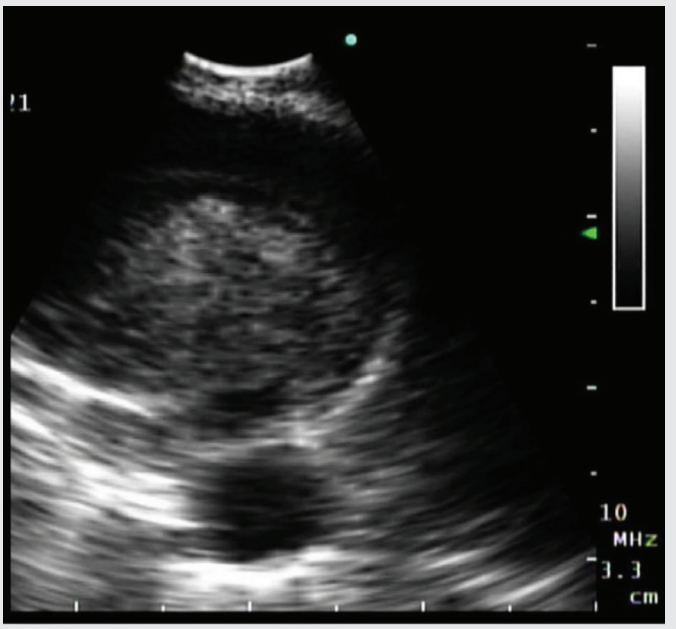

Figure 2. Thrombus visible in the right pulmonary artery at the level of the right bronchus intermedius.

thrombus was confined to the right lower lobe pulmonary artery. Flow was noted to be going around the thrombus. As the shock appeared less due to obstruction from the thrombus, these clinicians decided to use unfractionated heparin instead of tPA for treatment. Cultures later revealed Gram-negative organisms, and the shock was likely secondary to sepsis.[6]

Endobronchial ultrasound allows an experienced physician to assess some patients' central pulmonary vasculature and segmental arteries.[7] In critically ill patients, this is useful when assessing for massive PE and aids in allowing the physician on whether to start prompt treatment and, as noted above, what type.[5] In the hands of an experienced bronchoscopist, the time to complete an evaluation is only a few minutes.[1] As technology develops, the applicability of this imaging modality will likely increase and become more commonplace in the ICU.

Keywords: pulmonary emboli, endobronchial ultrasound

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