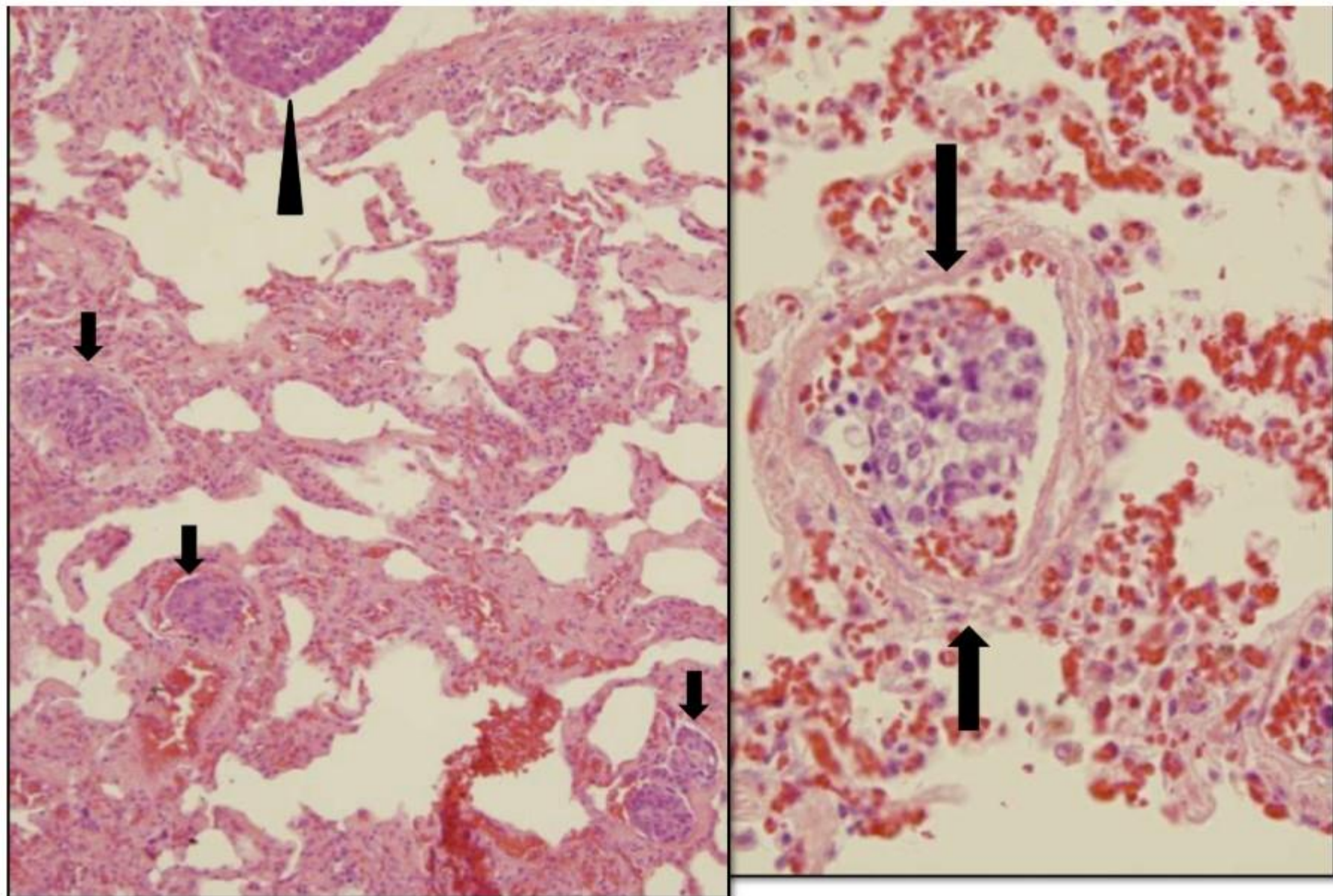




# Case #3

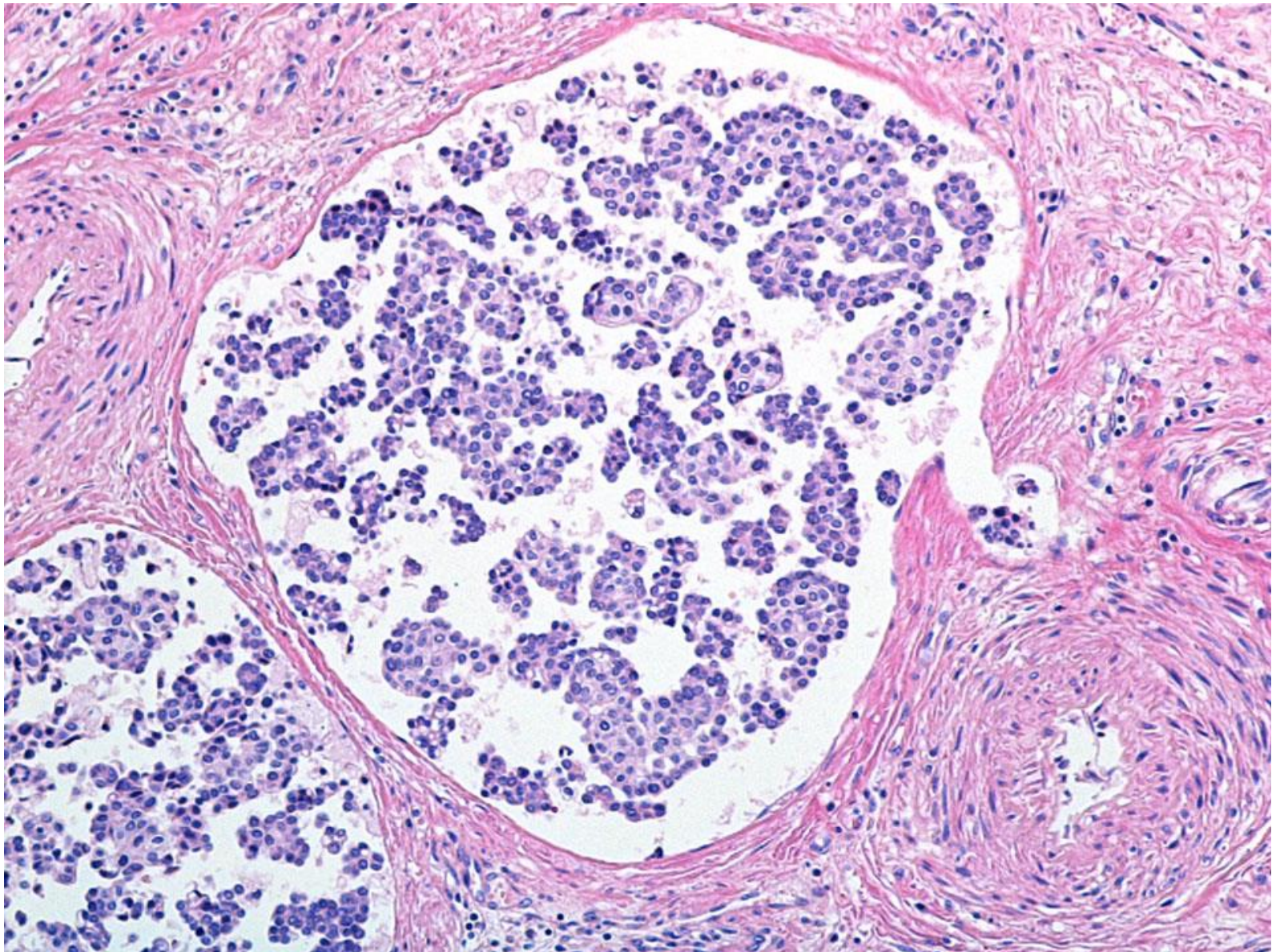
NAME Educational Activities Committee

Photo courtesy of Daniel Kirsch, Boston University



1. 32-year-old Caucasian female found dead on the toilet by her roommate. She had recently sought medical attention for persistent lower back pain. Femoral blood toxicology was significant for ethanol. Sections are of lung parenchyma stained with H&E. This finding is most consistent with:

- Venous thromboembolism
- Amniotic fluid embolism
- Microtumor embolism
- Septic embolism from infective endocarditis
- Non-small cell carcinoma of the lung



Additional metastatic lesion (cervical primary)

#### A. Venous thromboembolism

Due to the highly cellular appearance of this embolism, a venous thromboembolism (VTE) is not likely. VTEs will be composed of intact and/or fragmented RBCs admixed with fibrin and platelets. Alveolar damage, thickening, and alveolar hemorrhage and edema may accompany pulmonary VTEs. While VTEs are associated with many comorbid conditions, some of which can cause back pain, it is not a specific enough finding on its own to be diagnostic.

#### B. Amniotic fluid embolism

Amniotic fluid embolism (AFE) histology shows proteinaceous fluid mixed with fetal cells and possibly vernix, which is not seen. Additionally, decedent was not observed to be pregnant at autopsy or have a recent history of pregnancy.

#### C. Microtumor embolism (CORRECT ANSWER)

These photomicrographs show a highly cellular embolism with a high nuclear:cytoplasm ratio and many mitotic figures. Microtumor embolisms (MTE) typically present with dyspnea without a clear cause on imaging or other antemortem tests. In this patient the MTEs originated from an occult cervical carcinoma, which also gave rise to spinal metastases that caused the back pain noted in the medical history.

#### D)Septic embolism from infective endocarditis

Septic emboli are classically associated with bacterial endocarditis, and can be associated intravenous drug use. This patient had no notable toxicology or injection site marks. Iatrogenic causes of right sided endocarditis are also unlikely as there is no recent history of those types of procedures (dental work, prosthetic valves, central venous catheters). Histology of a septic emboli shows fibrinoid necrosis with a dense neutrophil and inflammatory infiltrate. There will also be bacteria clusters interspersed throughout area. Staphylococci and streptococci bacteria, especially *S. aureus*, are the most common pathogen in septic emboli, which are Gram positive and appear purple with a Gram stain

#### E) Non-small cell carcinoma of the lung

The tumor seen in this case is confined to intravascular spaces. Non-small cell carcinoma of the lung (NSCLC) would not have this distribution but instead be invasive and disorganized. It would arise from the epithelium of the airways, not vessel endothelium, making intravascular location unlikely. As NSCLC typically affects older patients, this makes it an unlikely choice given this patient's young age.

## References:

de Groot PM, Wu CC, Carter BW, Munden RF. The epidemiology of lung cancer. *Transl Lung Cancer Res*. 2018;7(3):220-233. doi:10.21037/tlcr.2018.05.06

Ruppert AD, Soeiro Ade M, de Almeida MC, de Oliveira MT Jr, Serrano CV Jr, Capelozzi VL. Clinical manifestations and pulmonary histopathological analysis related to different diseases in patients with fatal pulmonary thromboembolism: an autopsy study. *Open Access Emerg Med*. 2014;6:15-21. Published 2014 Mar 10. doi:10.2147/OAEM.S52891

Sinicina, I., Pankratz, H., Bise, K. *et al.* Forensic aspects of post-mortem histological detection of amniotic fluid embolism. *Int J Legal Med* **124**, 55–62 (2010). <https://doi.org/10.1007/s00414-009-0351-x>

Elsaghir H, Al Khalili Y. Septic Emboli. [Updated 2020 Jun 27]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK549827/>

Uruga, Hironori, et al. "Pulmonary tumor thrombotic microangiopathy: a clinical analysis of 30 autopsy cases." *Internal Medicine* 52.12 (2013): 1317-1323.