

## CLINICAL VIGNETTE

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# An Atypical Presentation of Pulmonary Embolism

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### Case

A ninety-nine-year-old female presented to the emergency department (ED) with altered mental status, aphasia and left sided weakness. Her housekeeper left her at 6 pm the night before in her usual state of health and found her at 9 am on the morning of presentation and called the paramedics.

The patient's medical conditions included coronary artery disease, status post coronary artery bypass surgery (CABG), angioplasties and bare metal stents; atrial fibrillation not on anticoagulation, history of stroke without residual deficits, hypertension, pelvic fractures, and osteoporosis. Her home medications included aspirin, digoxin, multivitamin, dipyridamole, atorvastatin, latanoprost eye drops, nebivolol and sublingual nitroglycerin. Her extensive allergy list consisted of over twenty-five medications, including penicillin, cephalosporins, fluoroquinolones, morphine, lovastatin, hydrochlorothiazide, ranitidine, atenolol and amlodipine. She is a retired nurse and lived alone. Her closest family lived in Canada.

On arrival in the ED, her vitals included a temperature of 36.9 degrees Celsius, heart rate of 69 beats per minute (bpm), blood pressure of 195/76 mmHg, respirations of 23 breaths per minute and pulse oxygenation of 96% on room air (RA). Per the ED assessment, there were no focal neurological deficits but she did not follow commands. The ED's main concern was a stroke and labs, brain imaging and neurology was consulted. The labs showed normal electrolytes, creatinine at her baseline, negative troponin levels, electrocardiogram (ECG) without acute ischemic findings and a urinalysis with 42 red blood cells, 5 white blood cells and six squamous epithelial cells. Computer tomography (CT) scan of her brain showed no acute findings but did show old small right cerebellar infarcts and age-indeterminate right corona radiata lacunar infarct. The neurologist did not find any focal neurological findings and noted that she had poor attention, did not participate in orientation questions and did not follow commands. The neurologist concluded that she had global encephalopathy and was unlikely to have had a new acute intracranial event. The neurologist thought the cause might be a possible infection given her positive urinalysis and she was admitted to the hospital for further evaluation.

At the time of admission to the hospital that evening, her vitals included temperature of 37.1°C, heart rate 63 bpm, respiration

16 breaths per minute, blood pressure 127/57 mmHg and pulse oxygenation of 96% on RA. She was unable to state her name or place, had poor attention, expressive aphasia with no focal neurological deficits. Additional collateral information collected from her niece in Canada indicated she went grocery shopping, attended outpatient physical therapy visit with a walker but did not drive. She was given IV fluids, repeat straight catheter urinalysis prior to a dose of aztreonam.

The following morning, the patient was able to state her name and location but continued to have expressive aphasia and confusion. She needed one-person maximum assist to get up from the hospital bed to the bedside commode. She had significant tenderness of both posterior calves, right more than the left. There was a scar of the medial distal right lower leg from prior vein harvesting for her CABG and mild erythema and edema of the right ankle. The repeat urinalysis was negative for signs of infection. Given the right lower leg findings, a right ankle x-ray and right lower extremity venous duplex were ordered. A brain magnetic resonance imaging (MRI) was ordered to evaluate for subacute/subtle acute intra-cranial events.

While she was about to be transported to her MRI, she complained of chest pain and the MRI was deferred. An ECG obtained was negative for acute ischemic findings. She was given sublingual nitroglycerin, which eventually improved her chest pain after two doses. While being evaluated for her chest pain, it was noted that her expressive aphasia appeared resolved. She spoke in paragraphs about her past medical history and reported that she frequently takes sublingual nitroglycerin for stable angina and has chronic pain in her right lower extremity. A CT angiogram of her chest showed an acute pulmonary embolism (PE) in the right lower lobe posterior basal artery. The right lower extremity venous duplex showed an acute deep venous thrombosis of the right peroneal veins of the upper calf. Her brain MRI was negative for acute intracranial events. After the MRI brain results returned, she was started on an intravenous heparin drip for anticoagulation, which was eventually switched to oral apixaban. Her troponin I peaked at 0.19 ng/mL and her echocardiogram showed preserved ejection fraction without evidence of right heart strain. Her mental status remained stable throughout the rest of the hospitalization.

## Discussion

Delirium is an acute confusional state that is frequently observed in the elderly and is characterized by distorted attention and disturbance in various cognitive domains.<sup>1</sup> Cerebral hypoxia is a common cause for such confusion. Pulmonary embolism (PE) is a common cause of hypoxia but may be difficult to diagnose and missed as it may not always cause typical symptoms.<sup>2-6</sup> Atypical presentations of PE include back pain, syncope and acute confusion.

Pulmonary embolism is not customarily considered as an acute cause of delirium in the elderly. There is no clear mechanism on how PE may cause delirium. In the available case reports, the presentation included shortness of breath and/or hypoxia that prompted the physicians to investigate further for a pulmonary contributor to the patient's delirium.<sup>7-9</sup> Active hypotheses from these case reports include PE-related hypoxemia, hypotension from circulatory collapse, acute ventricular impairment and/or paradoxical embolism causing the "lung-brain" connection. Interestingly, the patient in this case did not have hypoxia or dyspnea, but did have an acute deep venous thrombosis.

In conclusion, pulmonary embolism should be considered when the work-up for usual suspects for delirium is unrevealing, particularly in older adults, including in the absence of typical PE symptoms.

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