Clinical Image

A large incidental adrenal mass in a patient with sudden onset multiple organ failure

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A 55-year-old female was brought to the emergency room for sudden-onset chest pain and shortness of breath. Her only past medical history was mild hypertension not requiring medications. She had no family history of coronary artery disease. In the emergency room, she was in acute distress; her blood pressure was 153/121 mmHg, heart rate 151 beats/minute, respiratory rate 33 times/minute, and oxygen saturation 81% while on a non-rebreather mask. Chest X-ray showed diffuse basal consolidation (Figure 1A). Electrocardiogram revealed sinus tachycardia and nonspecific T wave abnormalities. Arterial pH was 7.14, lactate 70 mg/dL (normal 5-25), and the first troponin negative. She was promptly intubated and admitted to the intensive care unit. She became oliguric after the admission. Due to the suspicion of aortic dissection, chest CT was performed, which demonstrated extensive bilateral airspace edema (Figure 1B) without evidence of acute aortic syndrome or pulmonary embolism, and an incidental right adrenal mass. The adrenal mass measured 7.7 cm in its largest dimension, with central low-density areas (Hounsfield unit ~13) and peripheral high-density areas (Hounsfield unit ~35) before contrast administration. The adrenal mass showed no enhancement in the central low-density areas and partial enhancement in the periphery after contrast administration.

Figure 1. A) Chest X-ray showed diffuse basal consolidation. B) Chest CT demonstrated extensive bilateral airspace edema. C) The adrenal mass showed central low-density areas and peripheral high-density areas before contrast administration. D) The adrenal mass showed no enhancement in the central low-density areas and partial enhancement in the periphery after contrast administration.

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contrast (Figure 1C, asterisk), and with no enhancement in the central low-density areas and partial enhancement in the periphery after contrast administration (Figure 1D, asterisk). Troponin level rose to 6.0 ng/mL (normal <0.1) 4 hours after presentation. Transthoracic echocardiogram showed a small left ventricle size with ejection fraction 15-20% and apical akinesis. Coronary angiogram showed normal coronary arteries. So, what was the diagnosis?

Answer: Pheochromocytoma causing cardiomyopathy and multiple organ failure. The patient was treated with continuous renal replacement therapy, broad-spectrum antibiotics, and intravenous phentolamine. About 12 hours after presentation, she became progressively hypotensive and was treated with pressors. A few hours later, she developed shock liver, coagulopathy, and cardiac arrest. She died shortly after. Plasma metanephrines were drawn before pressors were given but the results were only returned 4 days after the patient died. The metanephrine level was >50.00 nmol/L (normal <0.49) and normetanephrine also >50.00 nmol/L (normal <0.89).

A large adrenal mass in a patient with unexplained cardiomyopathy and multiple organ failure is pheochromocytoma until proven otherwise (1). In academic centers, about 10% of patients with pheochromocytoma initially present with dramatic and severe cardiomyopathy, like this patient (1). Diagnosing pheochromocytoma in patients with unexplained cardiomyopathy requires a high index of suspicion. As plasma or urine metanephrines tests have a long turnaround time, usually a few days, in a patient with critical illness and suspicion of pheochromocytoma, imaging is more practical and important than biochemical tests in diagnosing this tumor (2). Although pheochromocytoma typically appears as a high-density mass on non-contrast CT and enhances after contrast administration, tumor tissue degeneration is common in pheochromocytomas which results in areas of the tumor with low density and moderate enhancement, as in this patient (3). This case thus highlights that pheochromocytoma may exhibit atypical imaging features and can cause multiple organ failure in an otherwise apparently healthy patient.

Conflict of interest

The authors declare that they have no competing interest.

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References