

what's your diagnosis?

A fatal condition in the thoracic aorta

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A 56-year-old female patient with anemia and a high sedimentation rate was referred from a nearby government hospital to our institution to investigate an underlying probable malignancy. Her

past medical story indicated that she had suffered from diabetes mellitus, hypertension, and hyperthyroidism. On admission, the patient had a body temperature of 38.0°C, a pulse rate of 75 beats/min, and blood pressure of 91/55 mm Hg. A physical examination showed tenderness on the left iliac fossa, and a bilateral chest radiography showed pleural effusions and minimal infiltration.

After blood and urine samples were taken for culture, she was begun on the levofloxacin IV 0.5 g antibiotic treatment. The cultures showed *Escherichia coli*, and the antibiotic regimen was changed to piperacillin/tazobactam and linezolid. A few days later, she had constipation, and an abdominal examination revealed diffuse distension and tenderness with sluggish bowel sounds. In addition, abdominal radiography detected air-fluid levels and abdominal ultrasonography showed a free peritoneal fluid. A contrast-enhanced chest multidetector computed tomography (MDCT) scan was then performed using an 8-channel MDCT system (GE Healthcare, Milwaukee, WI, USA) to investigate the probability of a malignancy and lung infection. This was done with the patient in the dorsal decubitus position during maximum inspiration, and multiplanar reformatted (MPR) images were interpreted in various planes. The chest MDCT images showed a significant bilateral pleural effusion with a maximum diameter of 4.5 cm at the left hemithorax, compression atelectasis in both lungs, a hypodense mass and calcifications at the right breast, and an enlarged thyroid gland. Additionally, the authors detected a filling defect secondary to a free-floating thrombus of approximately 4 cm in longitudinal diameter at the middle portion of the descending aorta. The thrombus was causing partial obstruction of the descending thoracic aorta lumen (Figure 1), and sagittal and coronal reformatted images determined that the thrombus was clinging to the aortic wall via a peduncle (Figure 2). However, no signs of aneurysm, dissection, or cardiac thrombus were observed.

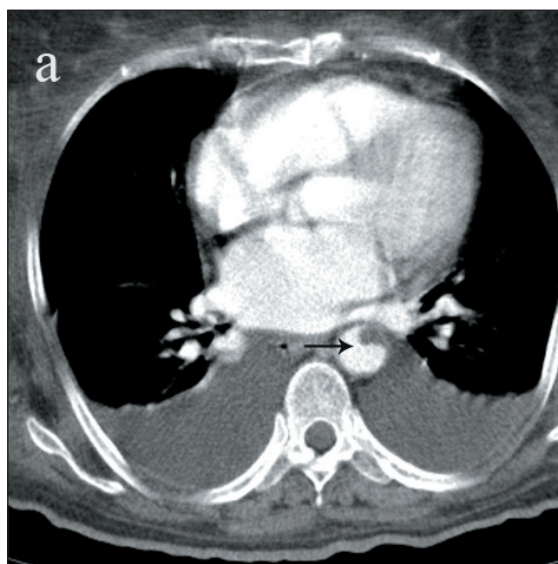


Figure 1. Contrast-enhanced axial MDCT images demonstrating filling defect at the descending aorta secondary to free floating thrombus (arrows).

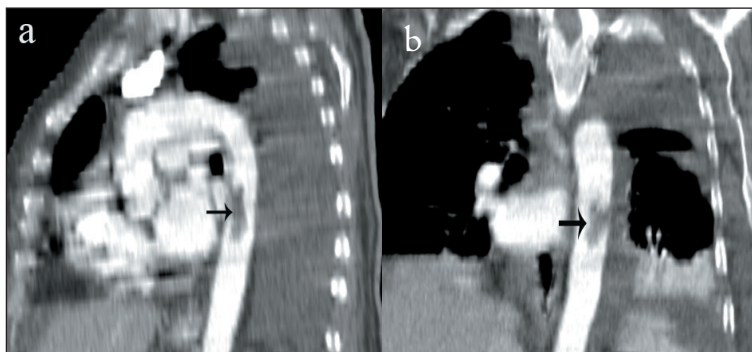


Figure 2. Sagittal (a) and coronal (b) MPR images showing the free-floating thrombus attached to the anterior wall of the aorta with a thin peduncle and extending down to the aortic lumen (arrows).

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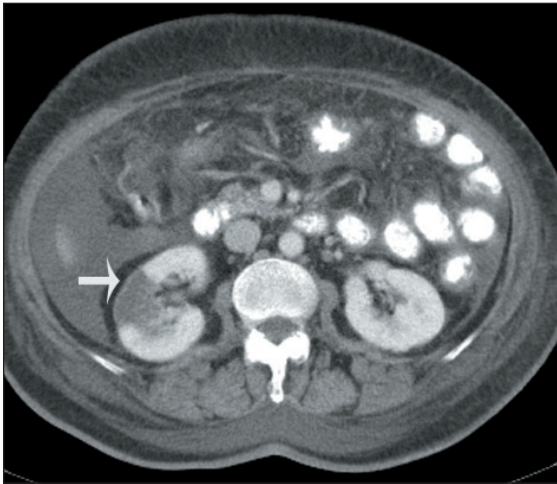


Figure 3. Axial contrast-enhanced MDCT image at abdominal sections showing a wedge-shaped right renal infarct (arrow).

Abdominal CT revealed massive ascites and a wedge-shaped renal infarction (**Figure 3**), but nothing notable was observed on echocardiography except for mild mitral regurgitation.

The patient received intravenous fluids, broad spec-

trum antibiotics, enoxaparin sodium, and total parenteral nutrition after the chest CT examination. Due to our patient's medical condition, surgery was not a viable option. However, on the sixth day after admission, the patient's clinical course worsened with respiratory distress, sepsis, and visceral ischemia and she was transferred to the intensive care unit (ICU). On her second day there, the patient became unconscious and was intubated. The laboratory test results showed a leukocyte count of 12.3×10^9 L along with hemoglobin levels of 10.5 g/dL, but the patient's thrombophilia workup was normal. Her potassium was 3.31 mmol/L, creatinine 2.14 mg/dL, lactate dehydrogenase 439 U/L, and albumin 2.79 g/dL. The patient then underwent emergency hemodialysis, and albumin replacement was performed. This led to a decrease in her blood pressure, and she was treated with positive inotropic agents. Unfortunately, the patient suffered cardiac arrest on the ninth day in the ICU, and despite full organ support and cardiovascular resuscitation, death occurred.

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Answer: Floating aortic thrombus

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Floating aortic thrombus is a rare condition that has been observed in case reports and small series in the published reports.¹⁻⁸ With technical developments in diagnostic procedures such as Multidetector computed tomography (MDCT) and transesophageal echocardiography, the incidence rate of this catastrophic condition has increased. Strong risk factors associated with acute aortic thrombus are cardiac disorders, such as left ventricular thrombus, myxoma, valvular heart disease, sepsis, aneurysms, atherosclerosis, and hypercoagulability states including sepsis, inflammatory bowel diseases, protein S and protein C deficiencies, cancer, and chemotherapy.¹⁻⁸ However, the underlying reason cannot always be determined.¹ Aortic emboli can originate from the left atrium as a consequence of atrial fibrillation or the development of a primary thrombus at the aorta,¹ and the mortality rate for these rare conditions is as high as 52% even with treatment,^{1,2} depending on the potential source of the embolism of the aortic thrombus. The risk of embolic events for mobile versus immobile thrombus has been reported as 73% and 12%, respectively,¹ and the location of the aortic thrombus is mostly in the descending aorta, as was the case with our patient.¹ For this reason, early diagnosis and therapy is essential. Therapy options include surgical removal, thrombectomy, balloon embolectomy, thrombolysis, anticoagulation, endarterectomy, or graft implantation.^{1,2}

Chest MDCT is the fast, non-invasive, cost-effective method for evaluating the size, location, and presence of an aortic thrombus and is also useful for determining the underlying reasons for catastrophic consequences of this often fatal condition. Furthermore, thin slice thickness and intervals are helpful during the evaluation of the aorta and obtaining multiplanar reformatted (MPR) and 3-dimensional (3D) images. In fact, evaluating the aorta with MPR images at more than 1 plane is an important advantage of MDCT. Moreover, the MPR and 3D images obtained with MDCT are also beneficial during the follow-up treatment. Transesophageal echocardiography is another important imaging modality, but many factors, such as obesity and abdominal bowel gas, can impede its ability to establish a true diagnosis.

All radiologists and clinicians should be aware of floating aortic thrombus, and it should be considered in the diagnosis of patients with risk factors associated with this rare, often fatal condition. Multidetector computed tomography should be immediately performed in these cases, and this technique should be the first choice for prompt diagnosis and follow-up.

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