CHEST

A 79-Year-Old Woman With Dyspnea and Hypoxemia That Worsened in an Upright Position

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CASE PRESENTATION: A 79-year-old woman presented to the ED with complaints of gradually worsening exertional dyspnea, dizziness, and chest discomfort. For several weeks she had not been able to perform light household work. The patient's medical history mentioned pulmonary embolism following immobilization (2012), several fractures after trauma, an ischemic cerebral vascular accident (2014), and curative treatment for breast cancer (1995). Her current medication included esomeprazole, clopidogrel, simvastatin, calcium/vitamin D, amitriptyline, and acetaminophen. CHEST 2017; 152(6):e139-e142

Physical Examination Findings

At presentation, the patient was afebrile with a heart rate of 93 beats/min, blood pressure of 150/79 mm Hg, respiratory rate of 16 breaths/min, and oxygen saturation of 93% at 4 L oxygen/min. Jugular venous distention was absent. Auscultation of the heart and lungs was unremarkable in both the supine and upright positions. There was no hepatomegaly, palmar erythema, spider telangiectasia, jaundice, clubbing, cyanosis, or edema. At admission, it was noted that her breathlessness increased and oxygen saturation decreased in the upright position.

Diagnostic Studies

Laboratory results, including liver function, were normal. Blood gas analysis (ambient air, seated position) showed a pH of 7.70, P_{CO_2} of 15 mm Hg (2.0 kPa), P_{O_2} of 42 mm Hg (5.6 kPa), oxygen saturation of 87%, bicarbonate level of 26 mmol/L, and base excess of 1.9 mmol/L.

Pulmonary function tests showed normal spirometric results and a slightly decreased diffusion capacity for carbon monoxide of 5.4 mmol/kPa/min (74% of predicted).

The shunt fraction was determined using the 100% oxygen shunt test in the upright position; it measured 24.1% (reference $<$ 10.0%).

Abdominal ultrasonography showed normal liver parenchyma and hepatoportal flow. CT imaging of the thorax showed normal lung parenchyma without pulmonary embolism. There was an elongated thoracic aorta with dilatation of the ascending aorta up to 42 mm (Fig 1). There were no pulmonary arteriovenous malformations.

An echocardiogram (supine position) showed normal left ventricular function and dimensions and no valve abnormalities or signs of pulmonary hypertension. An agitated saline bubble contrast echocardiogram showed no signs of cardiac or intrapulmonary shunting.

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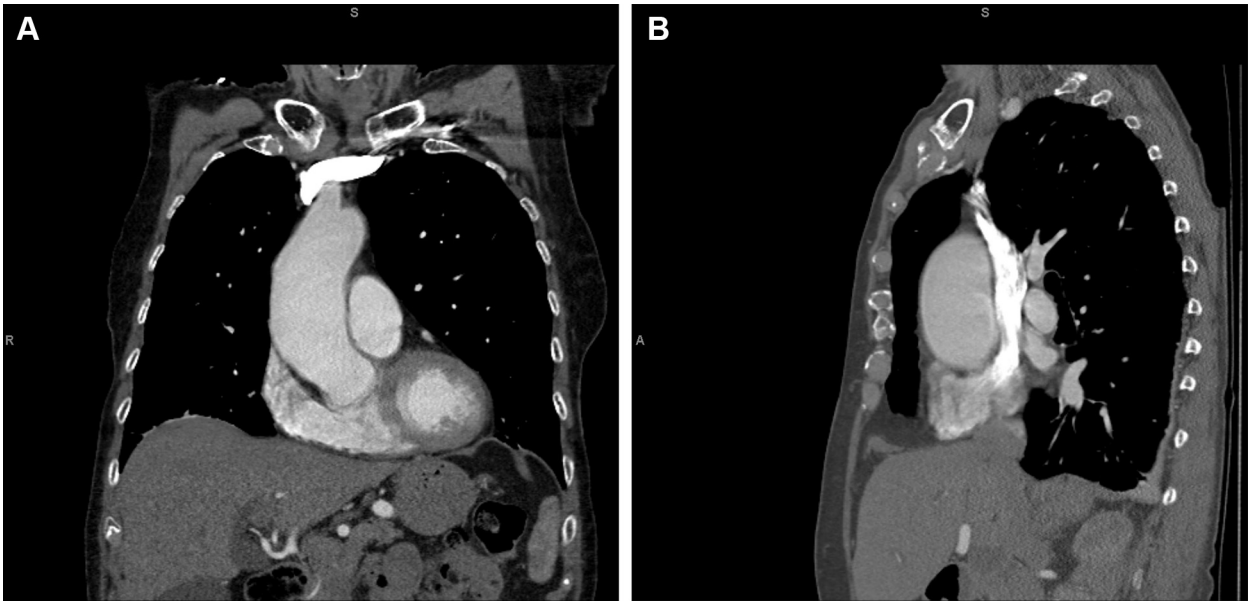

Figure 1 – *Coronal (A) and sagittal (B) chest CT showing the dilated ascending aorta.*

Right-sided heart catheterization (supine, no oxygen supplementation) showed normal wedge pressure (6/8 mm Hg), pulmonary artery pressure (16/4 mm Hg), right ventricular pressure (20/–3 mm Hg), right atrial pressure (2/0 mm Hg), right atrial and pulmonary artery oxygen saturation (both 69%), with systemic arterial and superior vena caval oxygen saturation of 94% and 75%, respectively. Hence, there was no sign of increased right-sided cardiac or pulmonary artery pressure or a left-to-right shunt. No left-sided oximetry run was performed.

What is the diagnosis?