If you hear a new worrisome heart murmur...

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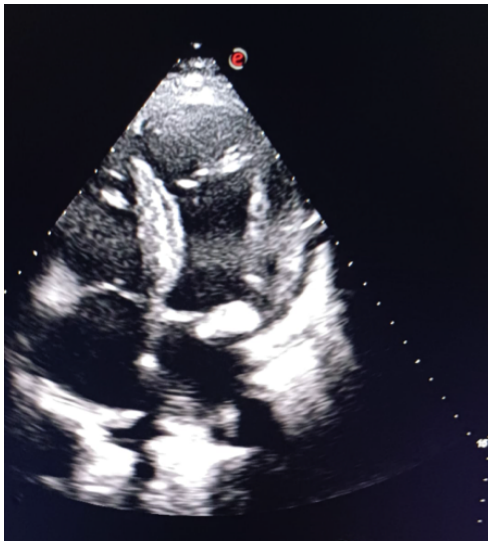

An 86-year-old woman presented to our emergency department for acute dyspnea without chest pain. She had taken amoxicillin/clavulanate 1 g/q12h for acute bronchitis. She underwent a left nephrectomy for cancer twenty years earlier. Blood pressure, heart rate, peripheral oxygen saturation, respiratory rate, and body temperature were 110/60 mmHg, 112 bpm, 90% with a non-rebreather mask (15 L/min), 25 breaths/min, and 36.5°C, respectively. Arterial blood gas documented pH 7.31, pCO_2 29 mmHg, pO_2 49 mmHg, $SatO_2$ 90%, HCO_3 14.6 mEq/L, lactates 3.8 mmol/L. Chest examination revealed absent vesicular murmur in the basal regions, crackles in the upper ones, and a pansystolic murmur. A lung ultrasound showed a white lung pattern with a severe pleural effusion and non-collapsible inferior vena cava. Laboratory findings documented WBC 18,610/mm^3 with CRP 84 mg/L (n.v.<10), AST 489 U/L (n.v. 11-34), ALT 296 U/L (n.v.<33), and troponin T 5191 ng/L (n.v.<20). ECG and echocardiography are reported in Figure 1 and Video 1, respectively.

Question

What is the most likely diagnosis?

1. Pulmonary hypertension
2. Acute mitral regurgitation
3. Post-myocardial infarction ventricular septal defect
4. Free wall rupture

Answer

The right answer is post-myocardial infarction (MI) ventricular septal defect (VSD). Post-MI VSD is the most common type of mechanical complication after acute MI[1,2] that occurs in approximately 0.21% with ST-segment elevation MI and in 0.04% with non-ST-segment elevation MI,[3] within the first week.[4] It is a surgical emergency associated with a high morbidity and mortality rate (80% at 30 days).[5] Risk factors are older age, female sex, a history of heart failure, and chronic kidney disease.[6] Symptoms may include dyspnea and orthopnea. Clinical examination reveals hypotension, cool peripheries, oliguria, and a new pansystolic murmur, with signs of pulmonary venous congestion. A 12-lead ECG may identify ongoing ischemia, evolving myocardial infarction, Q wave, and associated ventricular arrhythmia. A bedside echocardiogram is done to confirm the diagnosis and evaluate the size and location of a left-to-right shunt, biventricular function, and mitral regurgitation.[2] A heart team approach is always recommended:

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Ethics approval and consent to participate: as this was a descriptive case report and data was collected without patient identifiers, ethics approval was not required under our hospital's Institutional Review Board guidelines.

Informed consent: the patient provided consent for access to medical records at the time of admission.

Availability of data and materials: all data underlying the findings are fully available upon reasonable request to the corresponding author.

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optimal timing of surgical treatment should be discussed between a cardiac surgeon, cardiologist, and cardiac intensivist. Medical treatment is ineffective.[7] Surgery is the only definitive treatment, but with high operative mortality and morbidity. Intra-aortic balloon pumps (IABPs) with pharmacotherapy are used in >80% of emergencies – as in our case – and 65% of urgent repairs.[8] Options in patients who are not candidates for VSD repair include percutaneous closure, mechanical support for heart transplant, and palliative medical therapy.[2]

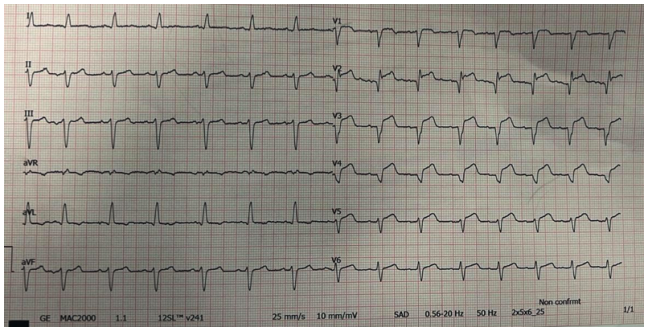

Figure 1. ECG at admission.

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Online Supplementary Material
Video 1. Echocardiography.