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## **A common complaint does not always mean a common diagnosis**

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**Contributions:** FC and EP collected details of the case and drafted the manuscript. LP cared for the patient and critically revised the manuscript. All the authors approved the final version and agreed to be held accountable for all aspects of the work.

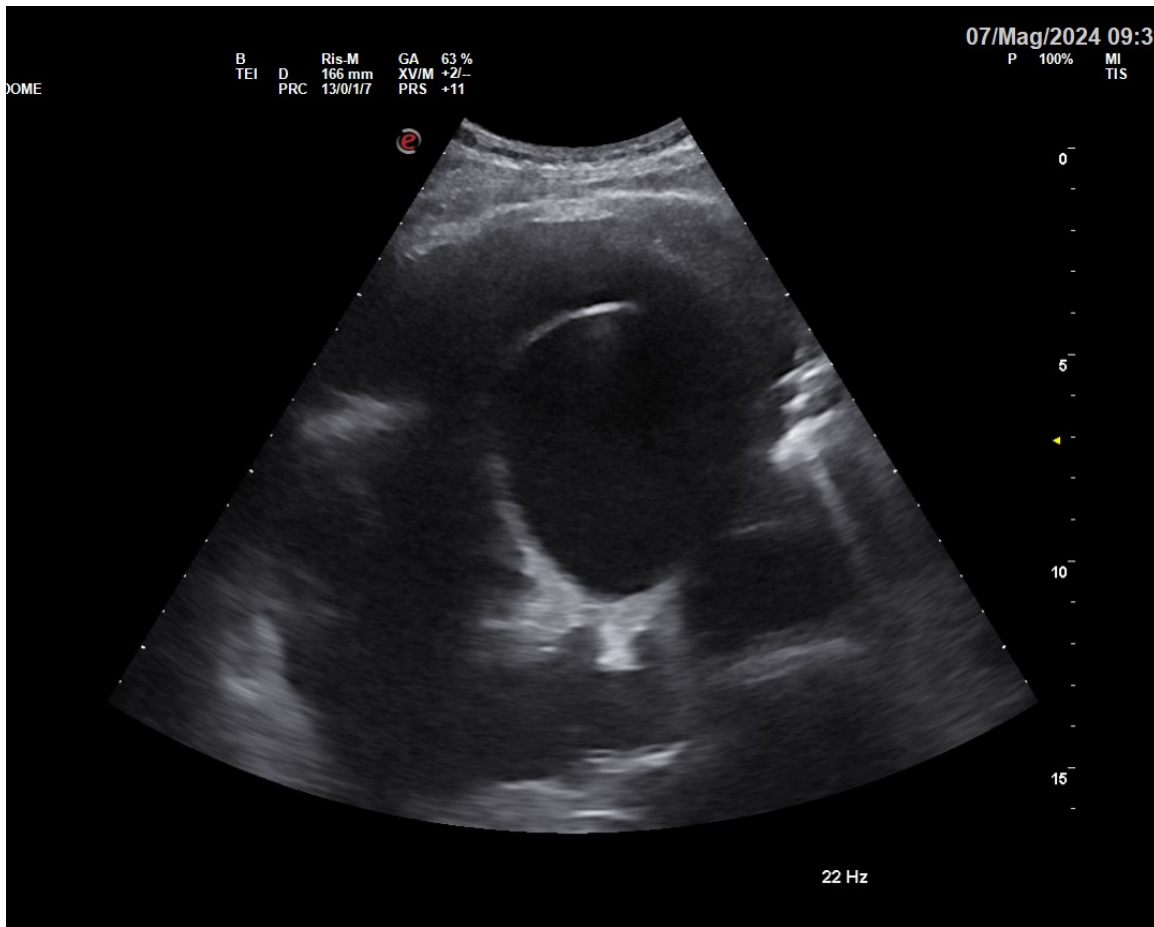
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**Ethics approval and consent to participate:** as this was a descriptive case report and data was collected without patient identifiers, ethics approval was not required under our hospital's Institutional Review Board guidelines.

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



An 83-year-old woman was referred to our Emergency Department (ED) for a chronic pericardial effusion with exertional dyspnoea that had been worse over the past several days. She denied any chest pain, syncope, fever, or leg swelling. She suffered from hypertension, heart failure NYHA I, diabetes mellitus type 2, and essential tremor treated with carvedilol, furosemide, olmesartan-hydrochlorothiazide, acetylsalicylic acid, and dapagliflozin. Her physical examination revealed no abnormalities. Her vital signs were blood pressure 130/70 mmHg, heart rate 70 bpm, peripheral oxygen saturation 95% in room ambient, and respiratory rate 18/min. Laboratory findings, including C-reactive protein and troponin T, were in the normal range. The electrocardiogram showed a sinus rhythm with normal atrioventricular conduction and ventricular repolarization. Point-of-care ultrasound documented an A-line pattern without pleural effusion and a diffuse and large (30 mm fluid strip) pericardial effusion without signs of cardiac tamponade and unchanged from the previous

echocardiogram (Video 1). It also showed a large pulsing mass 6x6 cm close to the right atrium with a predominant systolic flow (Video 2, Video 3).

### **Question**

What is the most likely diagnosis?

- 1) Constrictive pericarditis
- 2) Pulmonary embolism
- 3) Right coronary artery-coronary sinus fistula
- 4) Cardiogenic pulmonary edema

### **Answer**

An urgent contrast-enhanced cardiac Computed Tomography (CT) confirmed the diffuse pericardial effusion (max 5 cm) without leakage of contrast media into the pericardial space and showed an arteriovenous fistula between the Right Coronary Artery (RCA) and the magna cardiac vein with the coronary venous sinus. It also confirmed a vascular sac of about 6x6x7 cm, supplied in the arterial phase by the RCA, which has a tortuous course and a caliber of about 9 mm, well opacified in the venous phase. The left atrium was compressed in the absence of thrombotic formations.

Coronary Artery Fistula (CAF) is a rare congenital heart disease with an incidence of 0.002% in the general population.<sup>1</sup> It is defined as an anomalous connection between a coronary artery and any other cardiac vessels or cardiac chambers. Most CAFs involve the RCA draining into the right heart structures.<sup>2</sup> Although the presentation may initially be asymptomatic, untreated CAFs may lead to sequelae in early adulthood, such as proximal aneurysmal dilation of the involved vessels, myocardial ischemia, refractory angina, and congestive heart failure.<sup>3</sup> In very few cases, CAF can cause an unexplained chronic pericardial effusion<sup>4</sup> that rarely evolves in cardiac tamponade.<sup>5</sup> The definitive

treatment requires a percutaneous or surgical intervention.<sup>6</sup> In our case, considering the patient's advanced age and the high risk of an intervention to correct the coronary fistula, the cardiothoracic surgeon indicated a conservative treatment with close echocardiographic and clinical monitoring.

Shortness of breath is a common complaint among patients presenting to the ED. The etiology of this symptom is extremely varied, and the diagnosis often requires a specific diagnostic work-up. Only 1% of patients with unexplained dyspnea have a pericardial effusion requiring drainage.<sup>7</sup>

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