A comprehensive approach to reduced left ventricular function following massive pulmonary embolism: a case report

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Introduction: Massive pulmonary embolism (PE), which is characterized by severe hemodynamic instability, can lead to cardiac arrest. Patients who progress to cardiac arrest have an associated mortality rate of 65-95%[1]. Prognosis is especially poor in patients with reduced left ventricular (LV) function. Although LV dysfunction is observed in up to 10% of patients with massive PE and is typically associated with underfilling of LV, it can also be a consequence of an underlying condition[2].

Case Report: 49-year-old female with a history of arterial hypertension, menometrorrhagia (on oral contraceptives), and positive family history of cardiomyopathy (CMP) presented to the Emergency Room due to left leg swelling. Color Doppler confirmed deep vein thrombosis, but during observation, the patient became dyspneic, tachycardic (160/min), hypotensive (70/45 mmHg), and somnolent. CT pulmonary angiography confirmed massive pulmonary embolism with a dilated right ventricle (RV), as well as reverse flow in hepatic veins (**Figure 1**). Thrombolysis with alteplase (t-PA) was initiated immediately. However, shortly after starting t-PA, the patient went into cardiac arrest, with an initial rhythm of pulseless electrical activity, and cardiopulmonary resuscitation (CPR) was initiated. After 10 minutes of CPR, signs of spontaneous circulation were observed. Initial echocardiography revealed severe RV dilation, severe tricuspid regurgitation, and elevated pulmonary arterial pressure. Follow-up echocardiograms showed recovery of RV function but impaired systolic function of the dilated LV (ejection fraction [EF] 30-35%), consistent with a diagnosis of CMP. This suspicion was confirmed with magnetic resonance imaging. The patient recovered completely, and three months later, further evaluation of CMP was performed. CT coronarography revealed sub-occlusive stenosis of left anterior descending artery (LAD) (**Figure 2**). Coronary angiography and percutaneous coronary intervention (PCI) of the LAD were performed. After successful PCI of the LAD and the initiation of heart failure therapy, echocardiography showed partial recovery of systolic function (EF 45%).

Conclusion: Although LV dysfunction after PE is typically associated with RV dysfunction, preexisting cardiac disease may also play a role. This case highlights the importance of multimodal imaging in the acute setting, as well as the need for a detailed evaluation of LV dysfunction using multiple imaging methods after PE.

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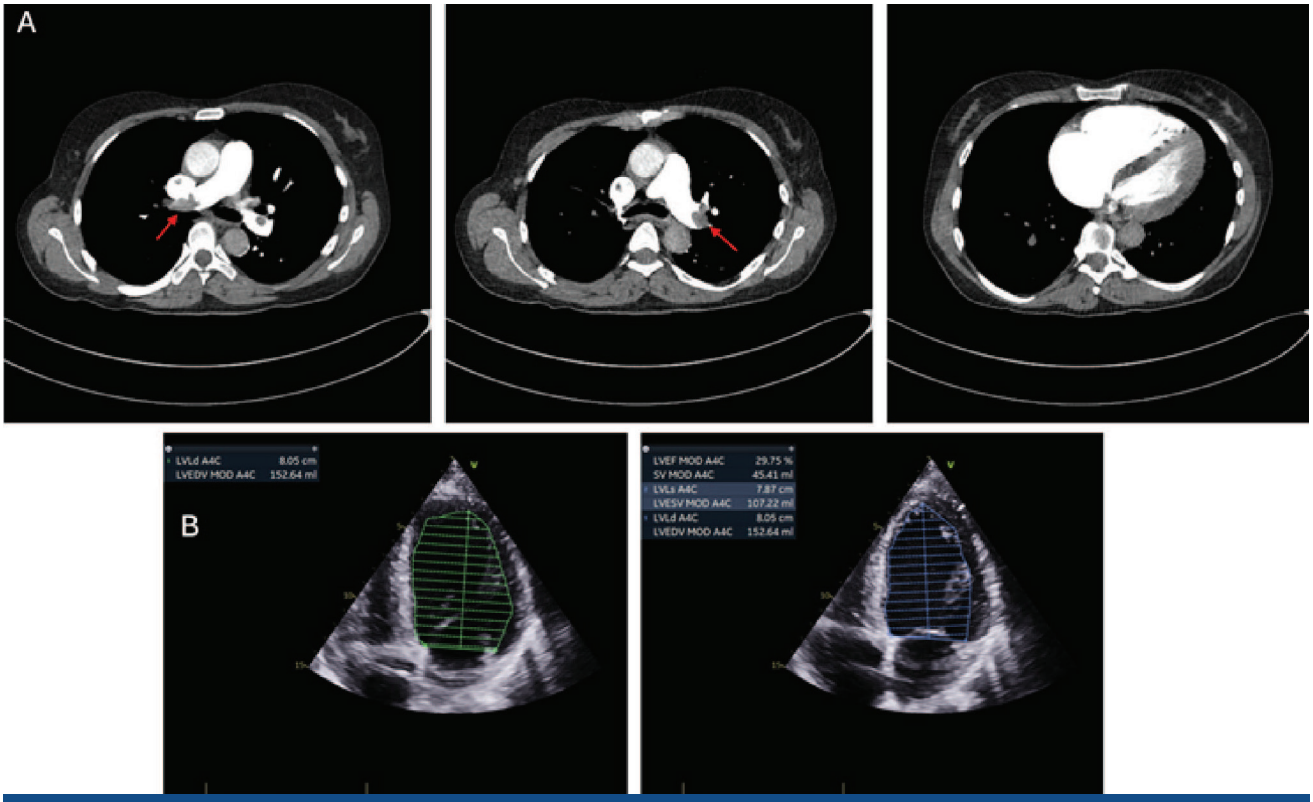

FIGURE 1. A) Multislice spiral computed tomography (MSCT) showing bilateral massive pulmonary embolism (red arrows) and a severely dilatated right ventricle and atrium, with the interventricular septum shifted to the left. B) Ejection fraction calculation after admission.

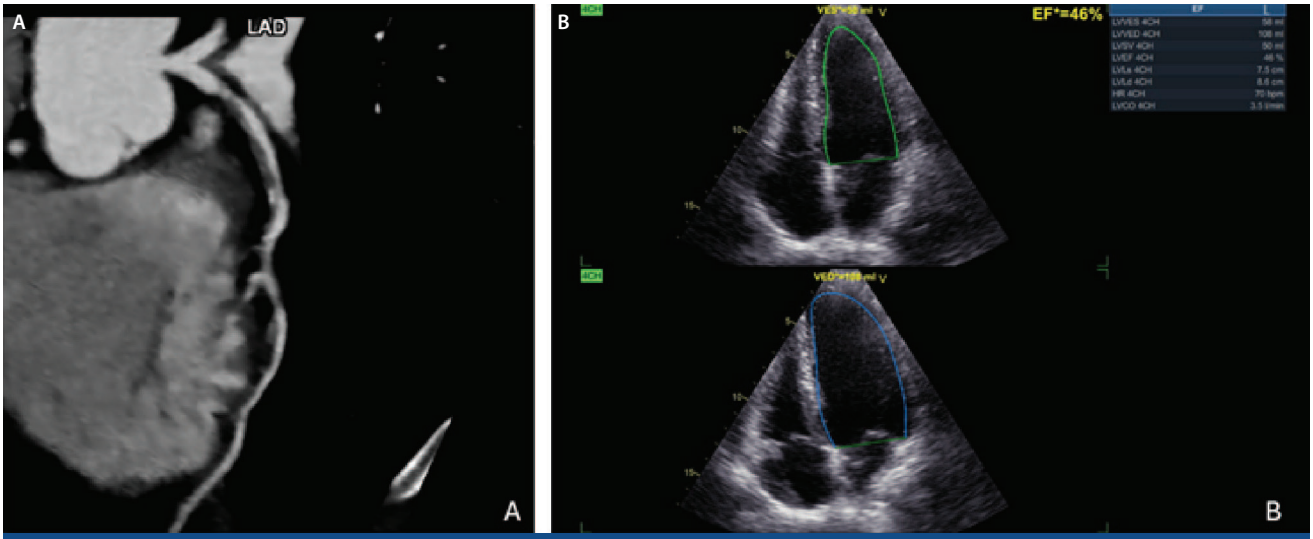

FIGURE 2. A) Multislice spiral computed tomography (MSCT) coronarography of the left anterior descending artery (LAD) showing sub-occlusive stenosis with soft plaque. B) Ejection fraction calculation after initiation of heart failure therapy and successful percutaneous coronary intervention in the LAD.

LITERATURE

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