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Large pleural effusion leading to cardiac tamponade

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Cardiac tamponade is a life-threatening clinical syndrome that is caused by an extrinsic cardiac compression, generally secondary to pericardial effusion [1].

A 43-year-old man admitted in our tertiary ICU for community-acquired pneumonia leading to severe ARDS was hemodynamically perfectly stable after initiation of venovenous extracorporeal membrane oxygenation (VV-ECMO) because of refractory hypoxemia. After 15 days,

while the patient was still totally dependent on the VV-ECMO for oxygenation, he suddenly became highly hypotensive requiring rapid fluid infusion and norepinephrine. A transthoracic echocardiography was performed showing a large left pleural effusion (Fig. 1a) associated with a diastolic collapse of the right atrium—a condition which is highly sensitive and specific for cardiac tamponade (Fig. 1b; Video 1). This was confirmed by a transesophageal echocardiography showing a small pericardial effusion and a large pleural effusion leading to a diastolic right atrial compression (Video 2). The decision was made to perform a thoracocentesis, in which 1200 mL of transudated pleural fluid was drained. Despite the absence of pericardial drainage, a marked clinical improvement and a normalization of the arterial blood pressure occurred. The echocardiography was repeated and showed the disappearance of lung parenchyma and pleural effusion which were evident on the previous images, thus allowing the expansion of the right atrium and the normalization of ventricular filling (Fig. 1c).

A large pleural effusion is able to cause a cardiac tamponade in the absence of significant pericardial effusion [2] as recently shown in an animal study in which pleural effusion was induced by infusing incremental volumes of saline into the pleural cavity. In the present study, hemodynamic and echocardiographic measurements were performed, showing that incremental volumes of unilateral pleural effusion induced a significant hemodynamic impact, which was fully reversible after drainage [3]. The present entity is rare enough to pose a diagnostic challenge and could lead to an unsafe emergency pericardiocentesis. Once recognized, thoracentesis is the first recommended therapy followed by reevaluation and should precede an attempt of pericardial drainage [4].

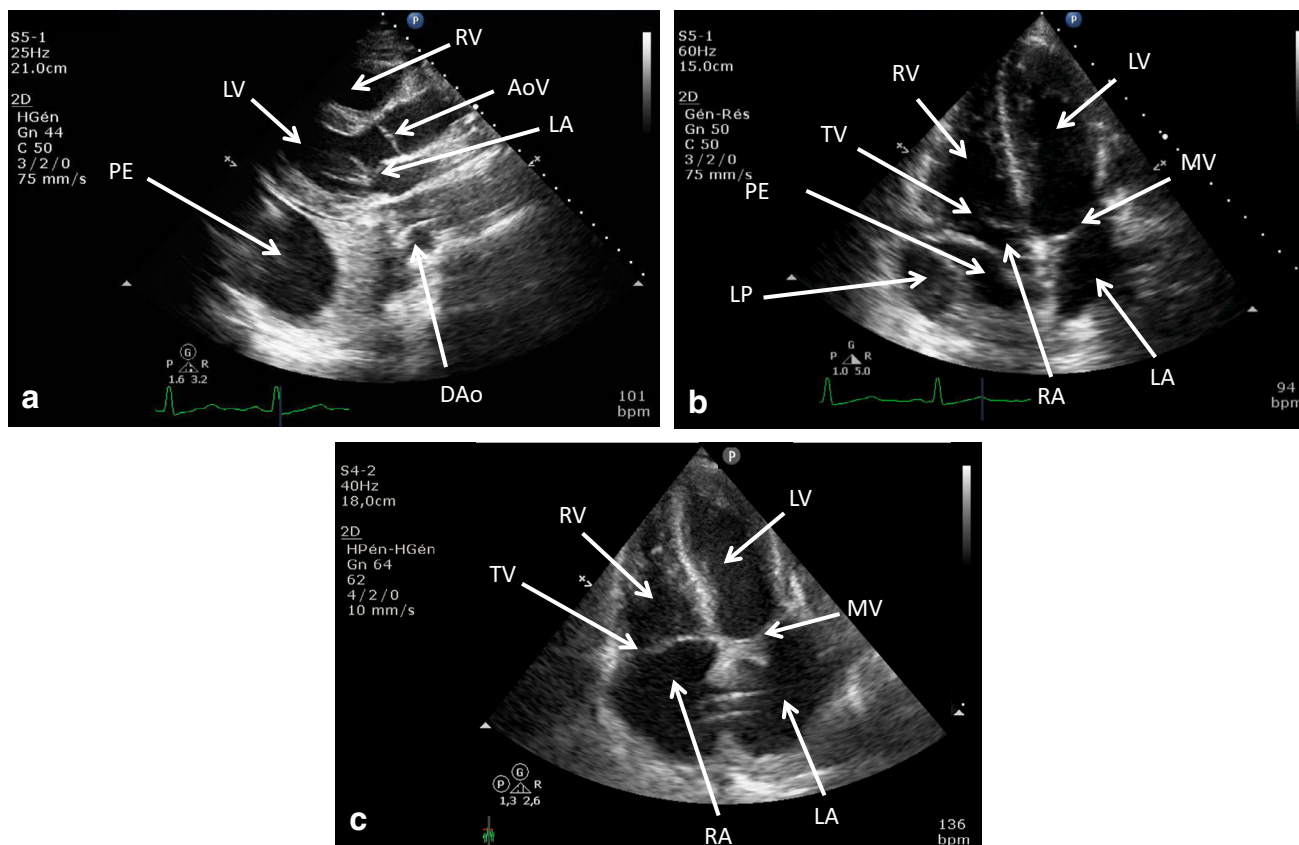


Fig. 1 Transthoracic echocardiography showing **a** (parasternal long-axis view) a large pleural effusion, **b** (apical 4-chamber view) the same large pleural effusion leading to a diastolic right atrial collapse, and **c** (apical 4-chamber view) after pleural drainage, no

more pleural effusion and no right atrial collapse. *AoV* Aortic Valve, *DAo* Descending Aorta, *LA* Left Atrium, *LV* Left Ventricle, *LP* Lung Parenchyma, *PE* Pleural Effusion, *MV* Mitral Valve, *RA* Right Atrium, *RV* Right Ventricle, *TV* Tricuspid Valve

Written informed consent for data analysis and publication of these images was not required by our local institutional review board as these observational images did not modify existing diagnostic or therapeutic strategies.

Compliance with ethical standards

Conflicts of interest The authors declare that no potential conflicts of interest exist with any companies/organizations whose products or services may be discussed in this article.

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