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Left atrial (LA) anatomy and physiology provide an incremental value in proper cardiac function. Transthoracic echocardiography is the first-choice modality for its assessment. Additional LA structures that may be visualized are thrombi, vegetations, heart tumours, external compressions or a diaphragm dividing the LA in cor triatriatum [1, 2]. Although, sometimes they prove to be normal anatomic variants [3]. In some cases multimodality imaging, including cardiac magnetic resonance, computed tomography, transesophageal and contrast echocardiography, is necessary to finally diagnose LA pathology. The last one may particularly be useful since it provides additional functional information, such as the presence of communication between the chambers, when other methods remains inconclusive [4].

48-year old woman, without history of cardiovascular disease, was referred to our cardiology outpatient clinic for further assessment of an additional membranous structure in the LA visualized in transthoracic echocardiography. She was suffering from dry cough for many years, arthralgia (mainly involving the small joints of the upper limb- metacarpophalangeal and interphalangeal joints) and muscle stiffness. Moreover, she had two miscarriages. Raynaud's phenomenon was not present. Transthoracic echocardiography showed a linear structure in the upper part of the LA, visible in all echocardiographic views, without signs of flow obstruction (Figure 1A–D). There was no pericardial effusion at other sites. Colour Doppler investigation revealed no communication between the sides of the abnormal structure. The probability of pulmonary hypertension was low. Multiple options were initially taken into account, such as cor triatriatum, LA dissection or an external compression. There were no signs of other cardiac

lesions possibly accompanying cor triatriatum such as atrial septal defect, anomalous venous return, bicuspid aortic valve or dilated sinus venosus. Transthoracic echocardiography was performed again several weeks later. Although the view of the LA had not changed, evident pericardial effusion was present in all echocardiographic views. This image suggested that the membranous structure was the LA wall compressed by pericardial fluid, which was confirmed by cardiac magnetic resonance (Figure 1 E, F). The distinctiveness of this case derived from the anatomy of the heart resulting in the fluid accumulating firstly by the LA, in the oblique sinus of the pericardium, that was atypical and led to further investigation. The presence of the pericardial effusion required extended diagnostics, which revealed highly elevated anti-nuclear antibodies HEp-2 (a nucleoral pattern). Due to a presence of clinical and serological symptoms indicating an autoimmune systemic disease, the patient was hospitalised at rheumatology department with the diagnosis of an undifferentiated connective tissue disease as she failed to meet the criteria for a specific autoimmune disorder. The amount of pericardial effusion and the view of the LA were stable during further observation.

Our diagnostic process has led us from the suspicion of a cor triatriatum sinister, through pericardial effusion, to the diagnosis of undifferentiated connective tissue disease. Although echocardiography remains the imaging modality of choice for the visualisation of pericardial effusion, there is a need of multimodality imaging in case of an unusual presentation. Since it has various underlying etiologies and multiple clinical pictures, the in-depht diagnostics is required.

Article information

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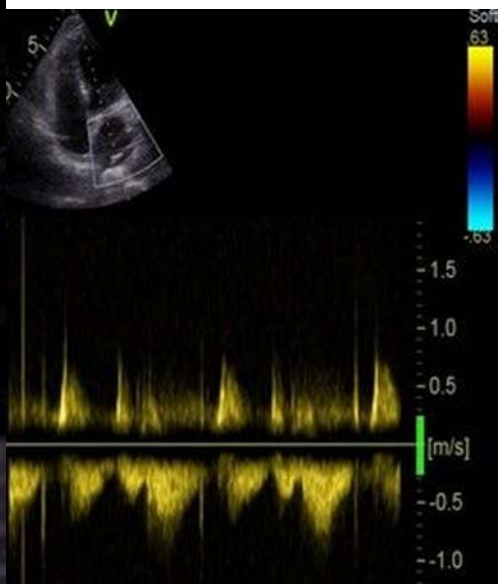
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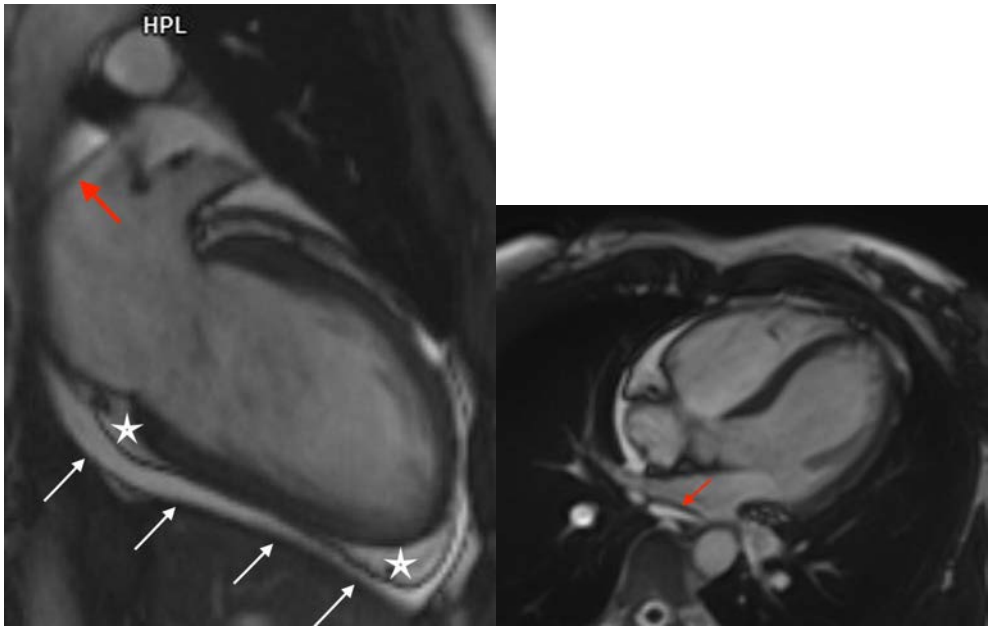

Figure 1. A–D. Transthoracic echocardiography. **A–C.** Additional membranous structure in the left atrium (arrows); four-chamber view (**A**), parasternal long axis view (**B**), two-chamber view (**C**). **D.** No significant gradient across the membrane on continuous wave Doppler; four-chamber view. **E, F.** Cardiac magnetic resonance imaging performed a few months later showing pericardial effusion mainly in the oblique sinus of the pericardium (red arrows); fluid along the inferior wall (white arrows); epicardial fat (asterisks)