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Case Report

Cor triatriatum simulating a left atrial mass in adult patient ☆

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ABSTRACT

We report a case of non-thrombosed cor triatriatum sinister simulating a cardiac mass on thoracic CT angiogram in a 58-year-old man presenting with acute chest pain. Following additional imaging with cardiac CT and MRI, and otherwise unremarkable cardio-pulmonary work-up, diagnosis of presumably coincidental cor triatriatum was established.

Case report

A 58-year-old male, with relevant past medical history of hypertension and hyperlipidemia, presented to the emergency department with acute chest pain and shortness of breath. He underwent standard cardiac work-up which failed to demonstrate any abnormality. In particular, the patient's EKG and serum troponin levels were normal. An echocardiogram performed shortly after admission was reported as unremarkable.

A triphasic chest CT angiogram for simultaneous coronary/pulmonary arteries evaluation was then performed, demonstrating a 2.5 cm left atrial mass centered at the ostium of the right superior pulmonary vein (RSPV) (Fig. 1), prompting differential diagnosis of intra-cardiac tumor or thrombus.

Subsequently, a cardiac MRI without and with intravenous injection of gadolinium contrast was performed. MRI demonstrated a region of relatively hypointense T1 and T2 signal at the ostium of the RSPV, which mirrored the signal of the blood pool following gadolinium contrast administration (Fig. 2A), delimited by a thin intra-atrial membrane (Fig. 2B). The overall MRI appearance of the abnormality was suggestive of an obstructive cor triatriatum septum causing partial obstruction of blood flow from the RSPV into the left atrium, and a cardiac CT was recommended for confirmation.

ECG-gated pulmonary venous CT angiogram was performed, optimizing evaluation of the pulmonary veins. It

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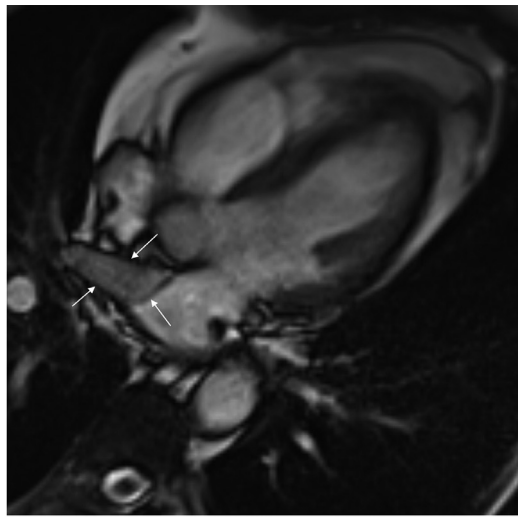
Fig. 1 – Initial CT angiogram of the chest. Axial image at the level of the left atrium demonstrates a 2.5 cm hypodense left atrial lesion centered at the ostium of the RSPV (arrows).



(a)

(b)

Fig. 2 – Cardiac MRI. (A) SSFP 4-chamber image demonstrates a well demarcated area of relatively decreased signal at the level of the RSPV ostium (arrows). (B) Coronal VIBE postgadolinium image shows a thin membrane around the RSPV ostium (arrows).

confirmed that the apparent left atrial mass seen on the original CT angiogram was indeed due to cor triatriatum sinister, with a fibrous-appearing membrane around the ostium of the RSPV (Fig. 3). A small fenestration of the membrane allowed communication between the left atrium and the pulmonary venous ostium (Fig. 3A), thus causing partial obstruction of pulmonary venous return from the right upper lobe. The ensuing sluggish blood flow in the pulmonary vein and its ostium resulted in differential contrast opacification between the obstructed atrial region and the rest of the left atrium.

It remains unclear whether there was a causal relationship between the findings of cor triatriatum and patient's acute chest pain, as his symptoms have spontaneously resolved and no additional abnormalities were discovered following a comprehensive cardio-pulmonary work-up. Therefore, it is possible that the discovery of cor triatriatum was purely coincidental.

Discussion

Cor triatriatum is a congenital abnormality accounting for 0.1% of all reported congenital cardiac cases [1]. It consists of an intra-atrial septum. Depending on the septum location and morphology, patients can present with symptoms mimicking mitral valve stenosis or remain asymptomatic [2]. The term "cor triatriatum," which literally means "tri-atrial heart," was coined in 1905 by Borst [3], who was building upon the original description of this condition made by Church in1868 [4]. Cor triatriatum is rare and has been frequently associated with other congenital cardiac anomalies in medical literature [5]. Most cases involve the left atrium, "cor triatriatum sinistra" (CTS), and are usually detected in early childhood. Some cases remain asymptomatic and therefore occasionally discovered in adulthood. Most common symptoms associated with CTS simulate those of mitral valve stenosis [2]. The embryological mechanisms leading to cor triatriatum formation are unknown, although several theories have been postulated [6]. Symptomatic cases are treated surgically [2].

Here we report a case of CTS simulating a left atrial mass on CT in an adult patient. Mass-like appearance on CT occurred as a result of decreased blood flow through the pulmonary venous ostium isolated from the rest of the left atrium by the CTS membrane.

Our search of PubMed database yielded only one similar report: Husain et al. have published a case report of a 14-year-old

(a)

(b)

Fig. 3 – ECG-gated pulmonary venous CT angiogram. (A) Axial and (B) coronal reformation images at the level of the left atrium demonstrate a linear membrane extending from the posterior-inferior to anterior-superior walls of the left atrium (arrows), effectively separating the ostium of the RSPV from the rest of the left atrium, with a small fenestration in the anterior aspect of the membrane, allowing for limited communication between the 2 compartments (arrowhead in (A)).

patient with CTS simulating a left atrial mass on echocardiogram [7]. To the best of our knowledge, ours is the first report of non-thrombosed CTS simulating a cardiac mass on computed tomography.

Patient consent

Informed consent for publication of their case was obtained from the patient.

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