Left atrial appendage thrombi

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Section: Cardiovascular
Imaging Technique: CT
Imaging Technique: Ultrasound
Case Type: Clinical Cases
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Patient: 55 years, male

Clinical History:

Chest SCT performed to rule out pulmonary embolism.

Imaging Findings:

Patient admitted with a history of breathlessness and weakness that developed over a two weeks period. The night prior to admission, he had an episode of acute chest pain, associated with palpitation, trembling and breathless. Admission ECG revealed an atrial fibrillation with ventricular tachycardia (200 beats/min). Admission chest X-ray demonstrated a global cardiomegaly associated with signs of left failure as Kerley lines, blurring of pulmonary vessels, peribronchial cuffing, perivascular and alveolar edema. To rule out pulmonary embolism, a contrast enhanced multi-slice SCT of the chest was performed. The SCT showed no pulmonary embolism but fortuitously demonstrated a filling defect inside the left atrial appendage, due to a non-enhanced curved 3 cm mass. A thrombus was suspected and a Transesophageal echocardiography was performed, which confirmed the thrombus at the tip of the swelled left atrial appendage.

Discussion:

Left atrial thrombi usually occur in the setting of stagnant blood flow. Specific predisposing conditions include atrial fibrillation, mitral valvular disease, mitral valve prostheses and cardiomyopathy (1). Left atrial clots often adhere to the atrial wall and can be laminar or protruding. Less commonly, they are unattached and freely mobile, presumably having detached from the atrial wall and may act as a ball valve, causing flow obstruction and, rarely, sudden death (2). Left atrial thrombi may embolize, with disastrous results. Their detection can greatly influence clinical decision regarding anticoagulation, cardioversion for atrial fibrillation, or even cardiac surgery. Transthoracic echocardiography can detect left atrial thrombi (1) but because of distance between the probe and the left atrium, it is not a particularly sensitive technique (sensitivity of 30 to 50%) (1). Large, mobile clots are generally easy to visualize, but laminar thrombi in the posterior left atrium or atrial appendage, where up to 50% of left atrial clots occur (1) may go undetected by transthoracic echocardiography. The appendage is not well defined in most patient. TEE has enhanced the ability to examine the left atrium and atrial appendage. Occasionally, the appendage may be multilobed, and the tissue separating these lobes must be distinguished from thrombi. Although TEE is superior to transthoracic echocardiography for detection of left atrial spontaneous contrast (3), visualization is operator-dependant. Multi-slice SCT are more and more widespread and units are even located at the emergency room. With fast scanning technique, better temporal resolution and reduced motion artifacts compared to conventional SCT, moving structures like the heart are better depicted (4). With a short pre-group adapted to the heart chambers enhancement, multi-slice SCT could become a modality of choice in the evaluation and characterization of intracardiac masses. ECG gating technique, in development, will certainly improve temporal resolution even more. Multi-slice SCT is also less invasive than TEE, and reproducible. This technique also has better imaging capabilities than TEE, especially for the left atrial appendage and the left ventricular apex (5). Cardiac MR
examination's efficiency is well established in the depiction of cardiac chambers. It offers the optimal spacial and temporal resolution. T1, T2 weighted and Gadolinium enhanced (even 3D breath-hold) sequences are appropriate to assess or rule out intra-cardiac mass like thrombus. In this particular case, the quality of the gated MR images of the heart chambers and especially the left atrial appendage will be spoiled by atrial fibrillation with ventricular tachycardia, especially if it has high rate fibrillating waves and TEE would probably be a better imaging modality. Access to MR units remains also difficult in most places, compared to Multi-slice SCT.

**Differential Diagnosis List:** Left atrial appendage thrombi

**Final Diagnosis:** Left atrial appendage thrombi

**References:**

Description: Contrast enhanced chest SCT section at the level of the pulmonary valve. The left atrial appendage is located between the left anterior descending coronary artery and the upper part of the left atrium. A curved non-enhanced filling defect is demonstrated inside the left appendage. In this case of atrial fibrillation an appendage thrombi is diagnosed. Origin:
Description: This examination confirmed a fixed left atrial appendage thrombus of 2.75 cm long-Origin: