Diverticulum of the Posterior Left Atrial Wall

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Abstract

Diverticula of the left atrium are very rare malformations of unknown etiology and may be associated with arrhythmias, thromboembolism, or mitral valve regurgitation. We report a patient with suspected coronary artery disease (CAD) in whom we performed a low-dose computed tomography coronary angiography using prospective electrocardiogram triggering. CAD could be ruled out. Incidentally, we found a diverticulum on the posterior wall of the left atrium combined with an interatrial septal aneurysm. The diagnosis was confirmed by transthoracic echocardiography.
Diverticulum of the posterior left atrial wall

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Abstract:
Diverticula of the left atrium are very rare malformations of unknown etiology and may be associated with arrhythmias, thromboembolism or mitral valve regurgitation. We report a patient with suspected coronary artery disease (CAD) in which we performed a low dose computed tomography coronary angiography using prospective electrocardiogram triggering. CAD could be ruled out. Incidentally we found a diverticulum on the posterior wall of the left atrium combined with an interatrial septal aneurysm. The diagnosis was confirmed by transthoracic echocardiography.

Keywords:
Cardiac imaging, left atrium
Diverticula of the left atrium are rare malformations of unknown etiology. We report a diverticulum on the posterior wall of the left atrium combined with an interatrial septal aneurysm. Diagnosis was established by low-dose computed tomography coronary angiography (CTCA) and confirmed by transthoracic echocardiography (TTE).

A 61-year-old woman was referred for workup of atypical chest pain and intermediate risk factors for coronary artery disease. We performed a low-dose CTCA using prospective electrocardiogram (ECG)-gating as previously described (1) resulting in an effective radiation dose of 2.6. A single dose of 2.5 mg isosorbide dinitrate sublingual was administered prior to CTCA scanning; no beta-blocking medication was given. During the scan the patient had a mean heart rate of 62 bpm, varying between 59 and 63 bpm. Image quality of CTCA was diagnostic in all coronary segments, and coronary stenoses were ruled out (Figure 1B). As an incidental finding a small diverticulum of the posterior left atrial wall was observed close to the right lower pulmonary vein orifice, tangent to the wall of the right atrium (Figure 1A and C). The foramen ovale showed an aneurysm-like enlargement. For further dynamic evaluation we performed a TTE (Figure 1D). The endsystolic diameter was 3.9cm. The mitral valve functioned normally; no mitral regurgitations have been seen. Anatomic findings from CTCA were confirmed. The diverticulum was adequately contracting throughout the cardiac cycle.

Cardiac CT has the ability to adequately describe abnormalities of the heart as it allows image reconstructions in any angle and in 3 dimensions. In the present case the difficulty in detecting a diverticulum of the left atrium by using TTE may be the misinterpretation as pulmonary vein. Three-dimensional echocardiography may be a helpful tool in the diagnosis of this entity.
While aneurysms of the atrial septum are frequently observed, atrial diverticula, especially those of the left atrium represent a rare malformation. Only a limited number of cases has been reported in the literature (2-4). Both identities are distinguished by their wall structure and motion. Diverticula display a regular wall structure and contract synchronized with the rest of the heart. By contrast, wall structure and motion of aneurysms are impaired (2). The etiology of both identities remains unidentified, however because of missing histological findings of degenerative diseases, a congenital origin is assumed (5), and a localized weakness in the atrial wall may lead to a progressive enlargement under pulsatile blood pressure.

Clinically, diverticula of the atrium usually present asymptomatic, but can also be associated with arrhythmias, thromboembolism or mitral valve regurgitation. Aneurysms of the atrial septum have also been identified as potential risk factors for stroke.

In this patient the etiology of atypical chest pain remains unclear and cannot be explained by the left atrium diverticulum – an incidental finding discovered during CTCA. The risk of thromboembolism appears low during sinus rhythms, due to the small size and the good contractibility of the diverticulum. No further investigation or treatment was recommended.
References:


Figure Legends:

Figure 1

Volume rendered MDCT images show normal coronary arteries without any indication of coronary artery disease (Image B). After removal of the right atrium and ventricle we can demonstrate the diverticulum of the left atrium (LA) indicated by the white arrow (Image A). The diverticulum is also shown in multiplanar reconstructions (Image C) and echocardiography (Image D). LV: left ventricle, RA: right atrium.