Myxoma detected by intracardiac echocardiography during pulmonary vein isolation

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Abstract

A 61-year-old woman with a low thromboembolic risk was scheduled to undergo pulmonary vein isolation (PVI) for paroxysmal atrial fibrillation. Transthoracic echocardiography showed no cardiac structural abnormality. Intracardiac echocardiography (ICE) identified a small left atrium mass attached to the atrial septum and the procedure was stopped before the transseptal puncture; the surgically resected tumor was cardiac myxoma. ICE is a reliable imaging modality to exclude left atrial thrombus. However, unusual and unexpected cardiac structures also prevent performing PVI, which pre-procedural transesophageal echocardiography could identify. Imaging options should be further discussed to improve patient care and safety.

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The study conformed to the Declaration of Helsinki and was reviewed and approved by the Institutional Review Board of The University of Tokyo (No. 2650).

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A 61-year-old woman with a low thromboembolic risk was scheduled to undergo pulmonary vein isolation (PVI) for paroxysmal atrial fibrillation. Transthoracic echocardiography showed no cardiac structural abnormality. Intracardiac echocardiography (ICE) identified a small left atrium mass attached to the atrial

septum and the procedure was stopped before the transseptal puncture; the surgically resected tumor was cardiac myxoma. ICE is a reliable imaging modality to exclude left atrial thrombus. However, unusual and unexpected cardiac structures also prevent performing PVI, which pre-procedural transesophageal echocardiography could identify. Imaging options should be further discussed to improve patient care and safety.

Case presentation

A 61-year-old woman was admitted to our hospital for symptomatic and drug-resistant paroxysmal atrial fibrillation (PAF) to undergo pulmonary vein isolation (PVI). She had no significant past medical history. Transthoracic echocardiography (TTE) showed no cardiac structural abnormalities with a small left atrium (LA) (LA diameter, 34 mm). CHADS2-Vasc score was 1 point (female sex), showing a low thromboembolic risk under optimal oral anticoagulant therapy, and she had taken rivaroxaban for more than 3 weeks. She had a negative COVID-19 test result, but we decided to use an intra-procedural intracardiac echocardiography (ICE) to evaluate left atrial appendage (LAA) for anatomy and thrombus, as an alternative to pre-procedural transesophageal echocardiography (TOE) and cardiac computed tomography (CT). Because, there is almost no risk of thrombus in patients with PAF under optimal anticoagulation whose CHADS2-Vasc score is 1. Before the transseptal puncture, ICE depicted an LA mass attached to the atrial septum, measuring around 15 mm in diameter (**Figure 1**), and the procedure was discontinued. TOE reveled vascular flow in the stemless mass, which was 1.7 cm in diameter, and 18F-fluorodeoxyglucose positron emission tomography (FDG-PET/CT) showed low-level FDG accumulation with a maximum standardized uptake value of 4.4, and therefore LA myxoma was suspected. Surgical resection of the intracardiac tumor together with concomitant surgical PVI was performed, and the histological diagnosis was cardiac myxoma.

Discussion

Pre-operative evaluation for PVI is usually performed using TOE or CT to assess LA/LAA and the surrounding anatomy and thrombus[1]. TOE is mostly used in our institute; however, it is time-consuming and may sometimes induce discomfort and cause complications, and in the era of COVID-19, the indication has been revised to prevent the spread of the virus. Cardiac CT is a reliable alternative tool but has certain limitations in differentiating thrombi from low blood flow and may cause serious kidney problems.

ICE is an emerging alternative for LAA assessment for patients undergoing PVI and has similar diagnostic efficacy for LAA thrombus[2]. We practically use intra-operative ICE for AF patients with low CHADS2-Vask score [?]1: we carefully evaluate LAA from right atrium and right ventricular outflow with ICE before the puncture of atrial septum. The present patient had a score of 1 due to sex alone and underwent intra-operative ICE, which revealed a small LA myxoma attached to the atrial septum. A previous study reported that TTE shows a high detection rate of cardiac myxoma similar to TEE[3], however, the present myxoma developing in the LA near the fossa ovalis, the most frequent site of origin, could not be found by TTE pre-operatively and even when we carefully examined the images post-operatively. The presence of LA myxoma is an absolute contraindication for PVI and the procedure was stopped before the transseptal puncture.

Intra-procedural ICE is a reliable imaging modality when the primary aim is to exclude LA/LAA thrombus but is unsuitable for evaluating unusual and unexpected cardiac structures, which pre-procedural TEE or CT can identify. Imaging options should be further discussed to improve patient care and safety.

Figure legend

Figure 1: Intracardiac echocardiography from RA showing LA mass

Arrow indicates a LA mass attached to the atrial septum. RA: right atrium, LA: left atrium.

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