Early-stage left atrial intramural hemorrhage mimicking partial coronary sinus thrombosis in a patient who received ablation for atrial tachyarrhythmias

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Introduction

Atrial fibrillation radiofrequency ablation is associated with a 2.6%–4.0% risk of acute complications.1 Left atrial (LA) intramural hematoma is an unusual complication of atrial arrhythmia radiofrequency ablation.2–5 All previously described patients presented with a masslike lesion of LA at the time of diagnosis. Because anticoagulation is usually required after LA ablation, early and accurate diagnosis is pivotal for management. We report a case of early-stage LA intramural hemorrhage, which presented with a cystlike lesion rather than a masslike lesion, and mimicked dilated coronary sinus with partial thrombosis. In this case, an accurate diagnosis was missed on the second day after the procedure, leading to enlargement of the hemorrhage. Proper diagnosis was reached on day 4, and the patient was stabilized after discontinuing anticoagulation. Follow-up echocardiography results showed that the hematoma resolved completely later.

Case Report

A 66-year-old female patient presented with intermittent palpitation, and the documented electrocardiogram showed supraventricular tachycardia with a cycle length of 240 ms. The tachycardia did not respond to adenosine therapy at a local hospital. The patient was referred to our institution, as the initial conventional electrophysiological studies suspected atrial tachyarrhythmias. Multiple atrial tachyarrhythmias could be induced by standard pacing protocols. Initial entrainment test frequently converted 1 atrial tachyarrhythmia to other types, making differential diagnosis difficult. Because right atrial flutter was not excluded, cavitricuspid isthmus linear ablation was performed first but failed to terminate the atrial tachycardia. Three-dimensional electroanatomic mapping using an irrigating CARTO ablation catheter (Biosense Webster, Diamond Bar, CA) showed a mitral annulus–dependent, counterclockwise-rotated reentrant tachycardia (Figure 1). Because left superior pulmonary vein–triggered atrial fibrillation was also induced during the electrophysiological study, circumferential left pulmonary vein isolation and linear ablation at the posterior mitral isthmus were performed successfully to eliminate all LA tachyarrhythmias. Anticoagulant agent (rivaroxaban 15 mg/d) was administered to prevent thromboembolism.

The patient developed persistently tight chest pain over the retrosternal area after the procedure; the pain was worse at a left lateral decubitus position. Transthoracic echocardiographic examination results on day 2 revealed an oval cystic

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Figure 1  CARTO (Biosense Webster, Diamond Bar, CA) mapping images show counterclockwise rotation surrounding the mitral annulus. LAT = local activation time; LAO = left anterior oblique; PA = posteroanterior.
lesion with inhomogeneous echogenicity over the posterior wall of the LA (Figure 2A; Movies 1 and 2). A small amount of pericardial effusion was also noted during this examination. Initially, enlarged coronary sinus with partial thrombosis was suspected, and rivaroxaban was continued. However, results of a follow-up echocardiography examination on day 4 indicated that the lesion was significantly enlarged and became consolidated (Figure 2A; Movies 3 and 4). The possible diagnoses included worsening coronary sinus thrombosis, huge LA thrombus, and intramural hemorrhage/hematoma. Cardiac computed tomography (CT) imaging showed a well-demarcated mass in the LA posterior wall with LA chamber compression (Figure 2B) as well as a well-defined coronary sinus, supporting the diagnosis of LA intramural hemorrhage-hematoma. We performed serial transthoracic echocardiographic examinations; the results showed that the hematoma size and pericardial effusion size gradually reduced. The patient was stable at discharge and had remained in sinus rhythm during the 3 months of outpatient follow-up period under amiodarone maintenance treatment. The subsequent echocardiographic examination on day 73 revealed nearly complete resolution of the hematoma and pericardial effusion (Figure 2A; Movies 5 and 6).

Discussion
The imaging presentations of established intramural LA hemorrhage-hematoma may mimic intra-atrial thrombus and coronary sinus thrombosis. Because most patients who received ablation for LA tachyarrhythmias need anticoagulation, accurate diagnosis is pivotal for clinical management. However, in this patient, the oval lesion in the initial postprocedure echocardiogram (day 2) was most likely at the active bleeding stage, during which the hematoma presented with a cystlike lesion containing inhomogeneous liquid, and the major challenge was to make a correct diagnosis. Because coronary sinus could be well identified in the CT scan results, the possibility of coronary sinus thrombosis was excluded. The anterior wall of the cystic lesion (day 2) and a well-demarcated endocardial border (day 4) of the lesion also excluded the possibility of intra-atrial thrombus. According to the literature, most patients presented with hypotension initially but recovered without surgical removal of hematoma. Intramural LA hematomas resolve within 1 month, and only 1 patient had previously undergone surgical removal of the hematoma because of subtotal occlusion of LA outflow complicated with acute pulmonary edema. Because of the self-limited course of LA intramural hemorrhage-hematoma, we recommended conservative treatment for this patient. The unusual cystlike pattern at the stage of active bleeding highlights the importance of cardiac imaging (CT scan or cardiac magnetic resonance imaging) for accurate anatomic identification and further management of catheter ablation–induced intramural LA hematoma. Notably, when the initial echocardiography report does not mention an abnormal finding of coronary sinus or atria, clinicians should be alert to symptoms and signs of acute procedure-associated complications. Hence, we recommend earlier CT scan or cardiac magnetic resonance imaging to confirm diagnosis and to exclude other complications, such as retroperitoneal hemorrhage, arteriovenous fistula, or pseudoaneurysm.

Conclusion
The early stage of LA intramural hemorrhage-hematoma may present with a cystlike lesion, making accurate diagnosis more difficult. Further CT scan or cardiac magnetic resonance imaging may be required to make a correct diagnosis. The management of LA intramural hemorrhage and hematoma after catheter ablation depends on the impact of the LA outflow obstruction on hemodynamics.
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Appendix

Supplementary data

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.hrcr.2017.01.009.
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