



Case Report **Cardiopulmonary Imaging**

Thrombosed saphenous vein graft aneurysm mimicking left atrial appendage mass: A rare complication of coronary artery bypass graft

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ABSTRACT

Saphenous vein graft aneurysm (SVGA) is a rare but potentially life-threatening complication of coronary artery bypass grafting (CABG). Its incidence is likely underreported due to asymptomatic cases and undiagnosed acute events. While SVGAs are more commonly associated with right atrial compression, presentation as a left atrial mass is rare. We present the case of an 85-year-old man with a history of CABG, who was incidentally found to have a left atrial appendage (LAA) density on a computed tomography (CT) chest, abdomen, and pelvis performed for unrelated symptoms of back pain and constipation. The density was initially suspected to be an LAA thrombus. However, a dedicated cardiac CT with delayed-phase imaging revealed a largely thrombosed aneurysmal saphenous vein graft to the obtuse marginal artery, which indented the LAA, mimicking an intracardiac mass. This case underscores the critical role of multimodality imaging, particularly cardiac CT, in differentiating vascular aneurysms from true intracardiac masses. Given the patient's asymptomatic status, conservative management with close follow-up was pursued. This case adds to the limited literature on SVGAs mimicking left atrial pathology and highlights the importance of recognizing this rare entity to avoid unnecessary interventions. It also emphasizes the evolving role of cardiac CT as a noninvasive, high-yield diagnostic tool for complex post-CABG anatomical assessments.

Keywords: Cardiac computed tomography angiography, Coronary artery bypass, Saphenous vein graft aneurysm

INTRODUCTION

A saphenous vein graft aneurysm (SVGA) is a rare but potentially life-threatening complication of coronary artery bypass grafting (CABG).^[1] One large prior study showed that the estimated incidence is noted to be 0.07%.^[2] However, this figure is likely an underestimation due to the many asymptomatic cases that go undiagnosed and sudden deaths from acute complications that remain uninvestigated.^[1] Additionally, gaining accurate insights into the prevalence and management of SVGAs is challenging because of significant reporting biases in the available literature.^[1] These aneurysms can lead to several complications, including compression of the right atrium or superior vena cava, the development of a fistula into the atria, thromboembolism, and myocardial infarction, as well as rupture.^[3] Several case reports have documented SVGAs identified through echocardiography, where they mimicked a right atrial mass due to compression of the right atrium.^[4,5] However, there are only a handful of cases in which SVGA presents as a left atrial mass.^[6] Here, we present a case of an 85-year-old man who had an incidental finding of

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a left atrial appendage (LAA) density noted on a computed tomography (CT) chest, abdomen, and pelvis, which was initially thought to be a LAA thrombus. A contrast-enhanced cardiac CT with delay phase clinched the real diagnosis.

CASE REPORT

An 85-year-old man presented to the emergency department with a history of back pain, constipation, and generalized fatigue. He had a past medical history of hypertension, hyperlipidemia, coronary artery disease post CABG, and percutaneous coronary intervention, and abdominal aortic aneurysm post endovascular aneurysm repair 2 years earlier. A CT chest, abdomen, and pelvis was done, which incidentally showed an ovoid density in the region of the LAA suggesting possible mass or thrombus, as shown in Figure 1. He was then referred to our hospital for further workup and management of the LAA density.

On admission, he was vitally stable and in no apparent distress. His pulse was 65 bpm, regular, and all the upper and lower extremity pulses were equal. All of his laboratory workup was unremarkable. To rule out a LAA clot and to further delineate the mass seen in the LAA, a cardiac computed tomography angiography (CTA) was performed. The cardiac CTA showed a largely thrombosed aneurysmal saphenous venous graft extending from the aorta to the obtuse marginal (OM) branch, which passed directly anterior to the LAA [Figures 2 and 3], mimicking a left atrial mass. The aneurysmal graft indented the LAA and remained patent distally. Delayed phase imaging confirmed the presence of a residual patent lumen within the aneurysm, demonstrated by persistent contrast enhancement, while the thrombosed regions remained hypoattenuating without delayed enhancement, aiding in better characterization of the aneurysm's internal structure [Figure 4].



Figure 1: A 85-year-old man with back pain, constipation, and generalized fatigue with a history of coronary artery bypass grafting. Axial view of contrast-enhanced chest computed tomography showing a 2.5 cm mass (white arrow) in or adjacent to the left atrial appendage.

The patient was discharged in a stable condition after relief of the presenting symptoms. At outpatient follow-up, he remained clinically stable and asymptomatic on medical therapy.

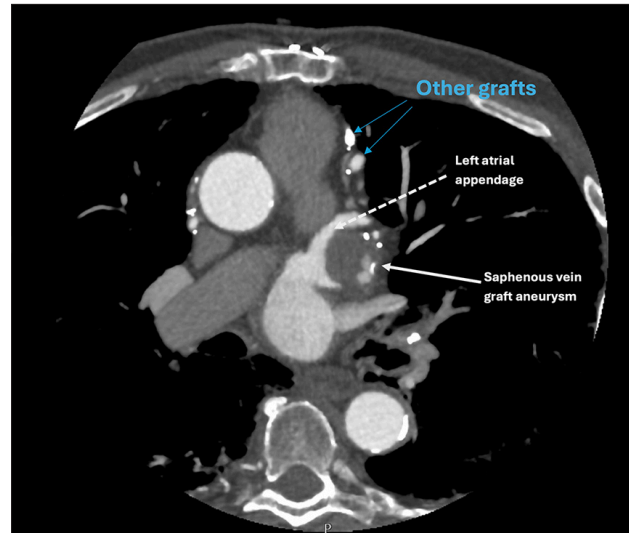


Figure 2: A 85-year-old man with back pain, constipation, and generalized fatigue with a history of coronary artery bypass grafting. Axial contrast-enhanced cardiac computed tomography angiography demonstrates the mass' relationship with the left atrial appendage and reveals the mass to have a partially thrombosed lumen. Another patent saphenous vein graft is noted anteriorly. (White arrow: Saphenous vein graft aneurysm, Dashed arrow: Left Atrial appendage, Blue arrow: Other grafts).

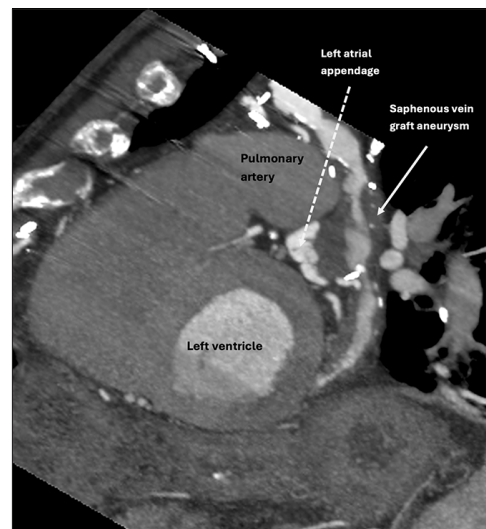


Figure 3: A 85-year-old man with back pain, constipation, and generalized fatigue with a history of coronary artery bypass grafting. Reformatted contrast-enhanced cardiac computed tomography angiography depicts the course of the saphenous vein graft aneurysm (straight line arrow). (Dashed arrow: Left atrial appendage).

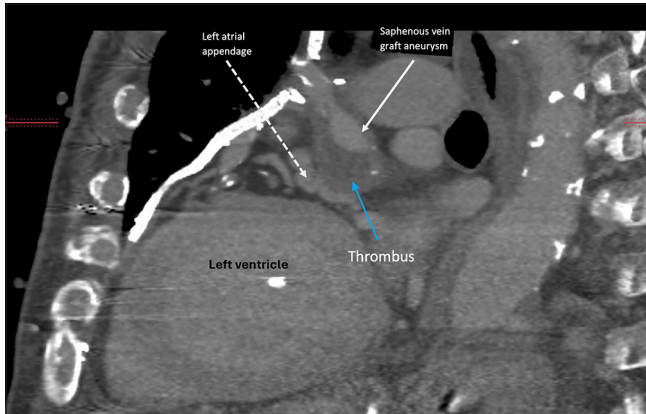


Figure 4: A 85-year-old man with back pain, constipation, and generalized fatigue with a history of coronary artery bypass grafting. Reformatted delay contrast-enhanced cardiac computed tomography angiography depicts the saphenous vein graft aneurysm position relative to the left atrial appendage. (White arrow: Saphenous vein graft aneurysm, Dashed arrow: Left atrial appendage, Blue arrow: Thrombus).

DISCUSSION

Saphenous vein grafts (SVGs) were introduced for the use of CABG in 1968,^[7] and soon thereafter, the first SVGA was reported in 1975, 6 months after its anastomosis.^[8] The average age of patients at the time of the diagnosis of SVGA is approximately 66–68 years, occurring about 15 years after CABG.^[1] The clinical presentation of SVGAs varies from vague nonspecific symptoms in most patients (approximately 68%) to chest pain (roughly 50%), shortness of breath (14%), and myocardial infarction (about 10%).^[1]

SVG to the OM branch is the second-most common type of SVGA.^[1] Among all the SVGAs, aneurysms large enough to compress or invaginate into adjacent cardiac structures, such as the left atrium, are even rarer. To the best of our knowledge, there are only 3 reported cases in the literature where the SVGA appeared as a left atrial mass. The first reported case^[6] was a 62-year-old man with a history of CABG 20 years prior, who had worsening angina symptoms. A coronary angiogram revealed an aneurysmal SVG to the OM branch. The diagnosis of an SVGA mimicking an left atrium (LA) mass was confirmed with contrast transesophageal echocardiography (TEE), with the absence of contrast opacification of the mass showing pulsatile diastolic flow directed caudally towards the left ventricle.^[6]

A similar case has also been reported in a 69-year-old man who had a CABG 20-years-ago and presented with a history of dyspnea and chest pain.^[9] Transthoracic echocardiography (TTE) revealed a mass compressing the left atrium and causing impaired mitral inflow with exaggerated respiratory variation. Cardiac CT revealed the mass to be a large aneurysm with thrombus of the SVG to OM abutting the left

atrium^[9] Our case highlights the importance of maintaining a high index of suspicion for extracardiac structures mimicking intracardiac pathology, especially in post-CABG patients.

Multimodality imaging is key to the diagnosis and management of SVGA. Over the recent years, there has been a notable transition toward less invasive imaging techniques, with a growing preference for CT modalities, which have surpassed invasive angiography for both the initial assessment and final confirmation of diagnosis.^[1] Some imaging features can guide the differentiation between a mass and a thrombosed saphenous vein, these include identification of the continuity between the aneurysm and the course of a known graft, the presence of contrast enhancement within a patent lumen on multiphasic CT imaging, and the characteristic location along the anatomical trajectory of a SVG from the ascending aorta to a coronary artery branch.

CONCLUSION

This case highlights a rare but important diagnostic consideration—SVGA mimicking a LAA thrombus on cardiac CT. Awareness of this potential pitfall is essential, particularly in patients with a history of coronary artery bypass grafting, to avoid misdiagnosis and unnecessary anticoagulation or invasive workup. Careful interpretation of cardiac CT imaging with attention to graft course and morphology can lead to the correct diagnosis. The patient remains clinically stable, with ongoing cardiology follow-up for surveillance of the aneurysm.

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