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Percutaneous Closure of a Saphenous Vein Graft Aneurysm Causing Left Internal Mammary Artery Compression and Left Ventricular Systolic Dysfunction

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A 58-year-old man was admitted for aortobifemoral bypass with a diagnosis of bilateral iliac occlusions. He underwent coronary artery bypass graft surgery 15 years ago, which included left internal mammary artery (LIMA) grafting to the left anterior descending artery and saphenous vein grafting (SVG) to the second obtuse marginal. Pre-operative chest x-ray revealed a potential mediastinal mass. Assessment with computed tomography demonstrated a patent 5.1 cm (sag-

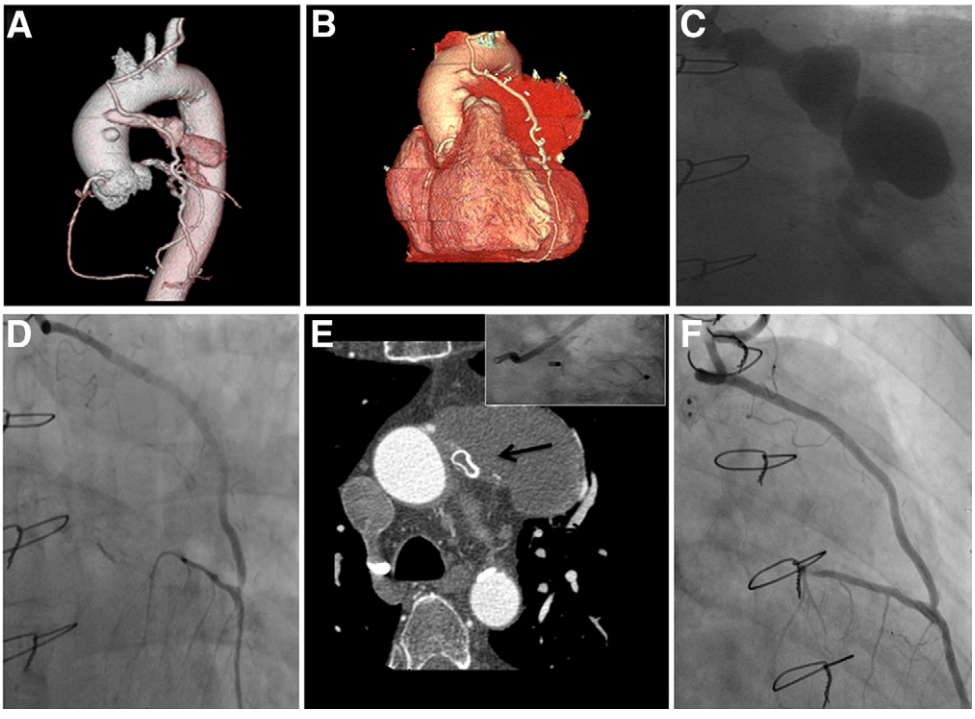

Figure 1. Assessment of Saphenous Vein Graft Aneurysm Before and After Percutaneous Closure

Computed tomography (CT) (3-dimensional reconstruction) showing luminal flow in the saphenous vein graft (SVG) aneurysm (thrombosed portion of the aneurysm is not visualized) **(A).** CT (3-dimensional reconstruction) showing the SVG aneurysm with compression of the left internal mammary artery (LIMA) **(B).** Angiographic imaging demonstrating a patent SVG aneurysm **(C)** and attenuation of contrast through the LIMA graft distal to aneurysmal point of contact **(D).** CT (2-dimensional) and angiographic **(inset)** imaging of successful Amplatzer vascular plug I deployment **(black arrow) (E).** Angiographic imaging showing restoration of dense contrast passage through the LIMA **(F)** (Online Videos 1 and 2).

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ittal) × 7.6 cm (anteroposterior) × 6.3 cm (transverse) SVG aneurysm, with associated compression of the LIMA graft (Figs. 1A and 1B).

Angiography confirmed a patent SVG aneurysm (Fig. 1C) with reduced contrast density within the LIMA distal to its aneurysmal contact point (Fig. 1D), suggesting diminished blood flow through the graft. Left ventriculography demonstrated severe anterior wall hypokinesis (Online Video 1). Due to its size and associated compression of the LIMA, aneurysmal closure using a percutaneous Amplatzer vascular plug (AGA Medical, Golden Valley, Minnesota) was decided upon. Risk of LIMA injury with surgical re-entry was thought to be high given its proximity to the sternum.

Due to the patient's bilateral iliac occlusions, vascular access was obtained via the left brachial artery. The SVG graft was engaged using a 6-F VL 3.5 guide catheter (Boston Scientific, Natick, Massachusetts) that was manipulated to the aneurysm neck. SVG diameter at the site of intended device deployment was 10 mm based on computed tomography/fluoroscopic imaging. A 12-mm Amplatzer vascular plug I was then introduced successfully proximal to the aneurysm. Fluoroscopic and computed tomography imaging confirmed appropriate occluder positioning (Fig. 1E) with minimal contrast flowing through the device.

Two months after the procedure, angiography demonstrated complete aneurysmal thrombosis, with no flow distal to the vascular plug. Additionally, dense contrast passage was visualized through the LIMA graft with marked improvement of left ventricular function and anterior wall motion (Fig. 1F, Online Video 2).

SVG aneurysms are rare complications of coronary artery bypass graft surgery (1). The natural history of these aneurysms is not well known; however, complications include thrombus embolization, rupture, and erosion into neighboring structures (2). To our knowledge, this is the first case of SVG aneurysm-associated LIMA compression with resultant left ventricular dysfunction. Although treatment has traditionally involved surgical ligation or excision, percutaneous closure is being increasingly performed, particularly in high-risk surgical patients, such as the patient described here (3,4).

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APPENDIX

For supplemental videos, please see the online version of this article.