

IMAGING VIGNETTE

BEGINNER

CLINICAL VIGNETTE

Left Main Coronary Artery to Superior Vena Cava Fistula Unmasked by Endarteritis



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ABSTRACT

Coronary artery fistulas are rare vascular malformations that can present with a broad range of symptoms. We present a case of a left main coronary artery to superior vena cava fistula that was discovered during a work-up for sepsis. A multidisciplinary approach is crucial for successful management of these vascular malformations. (**Level of Difficulty: Beginner.**) (J Am Coll Cardiol Case Rep 2021;3:1599-1601) © 2021 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

A 56-year-old man without prior cardiac history presented to the hospital with acute onset hemoptysis and 3 months of night sweats and weight loss. Chest computed tomographic (CT) angiography demonstrated cavitory lesions in the left lung suggestive of septic emboli. Blood cultures grew *Streptococcus parasanguinis* and *S. salivarius*. Transesophageal echocardiogram demonstrated mobile echodensities in the superior vena cava (SVC) and enlargement of the left main coronary artery (LMCA) (**Figure 1A**). Coronary CT angiography and left heart catheterization confirmed the presence of LMCA to SVC arteriovenous fistula (AVF) (**Figures 1B to 1D, Video 1**). The patient was apprised of the pros and cons of surgical versus transcatheter closure and opted for a percutaneous approach. He was scheduled for the procedure after completing 4 weeks of intravenous antibiotics to reduce the risk of recurrent infection. Our goal was safe and effective transcatheter closure of the fistula with the least number of devices while avoiding inadvertent occlusion of the epicardial coronary arteries and their major branches.

Intravenous cefazolin was administered at the beginning of the case. Seven-French sheaths were inserted into the right femoral artery and vein. With the use of transfemoral arterial access, a 7-F JL-4 guide catheter was used to engage the LMCA. Through a 6-F guide extender, a Corsair Pro microcatheter (Asahi Intecc) and a Suoh III (Asahi Intecc) coronary wire were used to navigate through the AVF into the SVC. The wire was exchanged for a 0.035-inch Glidewire (Terumo), which was snared and exteriorized with the use of a 10-mm snare from the femoral vein into a 7-F Pinnacle Destination sheath. The AVF diameter was measured for device size selection by means of quantitative angiography. Thereafter, 3 Amplatzer Vascular Plug II devices (Abbott; 14 mm, 16 mm, and 18 mm) and 3 MReye vascular coils (Cook Medical; 5 cm × 12 mm coils) were deployed from the SVC side into the fistula. Finally, a POD packing coil (Penumbra) was delivered through the arterial side of the conduit, resulting in successful closure of the AVF (**Video 2**). The total procedure time was 150 minutes, and 200 cc contrast (iodixanol) was used. Fluoroscopy duration was 41.8 minutes with total air

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**ABBREVIATIONS
AND ACRONYMS**

AVF = arteriovenous fistula

CT = computed tomography

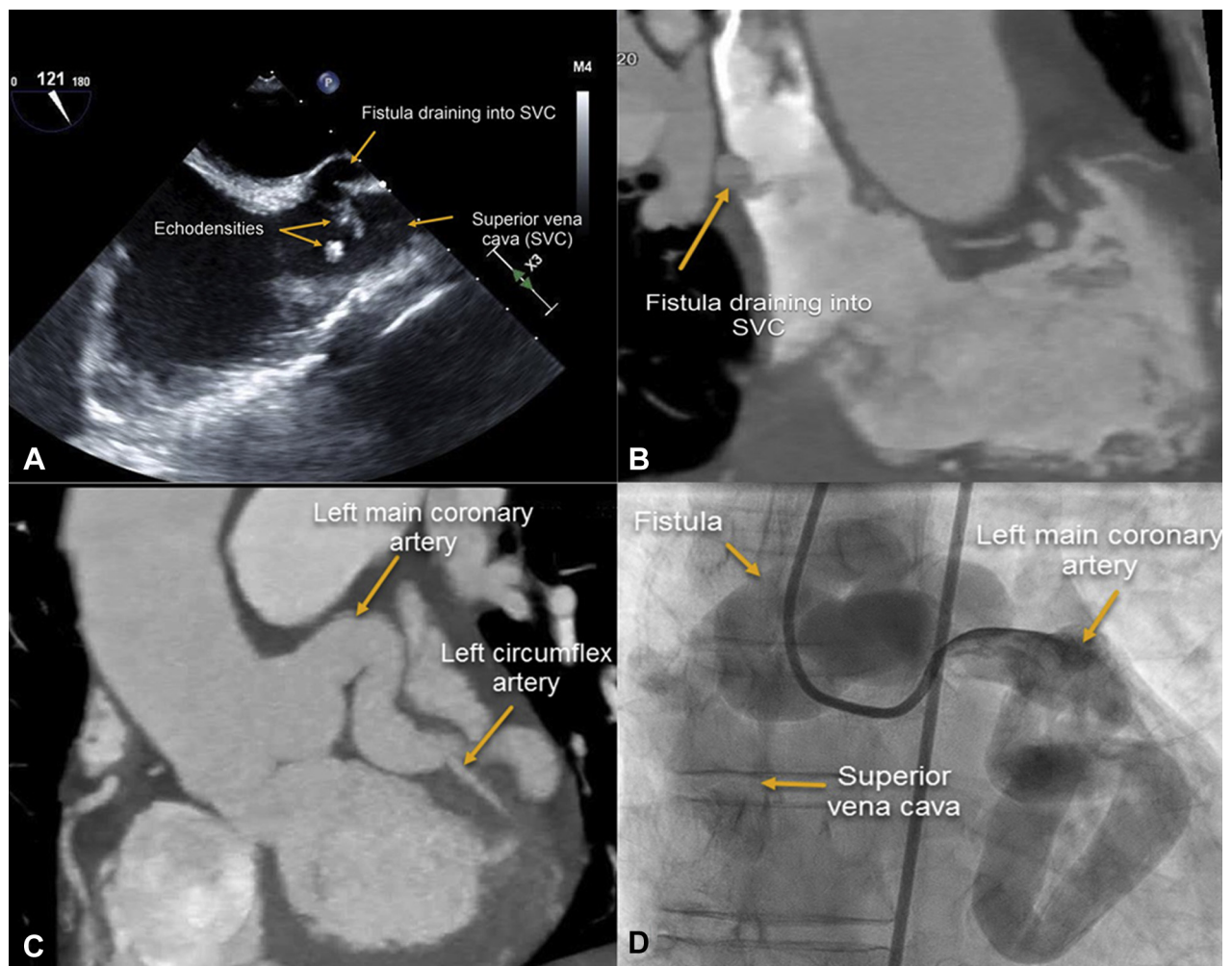
LMCA = left main coronary artery

SVC = superior vena cava

kerma of 1.4 Gy. The patient was discharged home the following day on aspirin and rivaroxaban, and has remained asymptomatic thus far 7 months after the procedure. He has been instructed to take prophylactic antibiotics before high-risk dental and respiratory tract procedures to prevent endocarditis.

LMCA to SVC arteriovenous fistulas are rare, with large case series reporting <2% incidence among all patients with coronary AVFs (1). In symptomatic patients with indications for closure, a multidisciplinary approach is recommended (2). Selected patients with indications for closure may undergo percutaneous closure of these defects safely, with technical success rates approaching 90% and subsequent long-term durability (1). Long-term anticoagulation has been recommended to mitigate the risk of coronary thrombosis in patients with dilated residual fistula segments (3).

FIGURE 1 Multimodality Imaging Showing Left Main Coronary Artery to Superior Vena Cava Fistula



(A) Bi-caval view on transesophageal echocardiogram demonstrating mobile echodensities in the superior vena cava (SVC). **(B and C)** sagittal coronary computed tomography angiogram demonstrating enlarged left main coronary artery (LMCA) with a fistula draining into the SVC. **(D)** anteroposterior cranial projection during invasive coronary angiogram demonstrating large sausage shaped fistular connections from LMCA to SVC.

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Dr Tehrani is a consultant and speaker for Medtronic. Dr Thompson is a proctor for Abbott. Dr Batchelor is a consultant and speaker for Abbott; and is a consultant for Boston Scientific, V-Wave. Idorsia. and Philips. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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KEY WORDS arteriovenous fistula, coronary fistula, endarteritis, percutaneous closure, septic emboli

 **APPENDIX** For supplemental videos, please see the online version of this paper.