Left Main Coronary Artery to Bialtrial Fistula Associated With Severe Functional Mitral Valve Regurgitation

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A 67-year-old woman had progressive dyspnea, a loud murmur of mitral regurgitation, and a separate, continuous cardiac murmur suggesting shunt. Electrocardiography-gated computed tomography demonstrated a 7-cm aneurysm of the left main coronary artery with possible connection to the right atrium (Figure, A), along with a thin tissue boundary between the aneurysm (Figure, B) and left atrium, raising the possibility of secondary erosion (Figure, C, arrow). Echocardiography revealed severe functional mitral regurgitation, presumably due to volume overload (Figure, D and Movie I in the online-only Data Supplement). Flow was seen between the aneurysm and the left atrium (Figure, E and Movie II in the online-only Data Supplement). Intraoperative evaluation identified a large fistula at the left main coronary artery trifurcation (Figure, F), multiple erosions into the left atrium dome (Figure, G), and a communication to the right atrium (Figure, H) near the superior vena cava–right atrium junction. The origin of the fistula was identified, resected, and patched with bovine pericardium. The mitral valve was repaired, and communications to the left atrium/right atrium were closed. Postoperative transesophageal echocardiography (Figure, I and Movie III in the online-only Data Supplement) and computed tomography (Figure, J) demonstrated the absence of aneurysm and fistulous connections. The patient’s postoperative course was uneventful.

Disclosures

The Division of Cardiovascular Surgery has a research grant entitled “Randomized biological aortic valve replacement” funded by Edwards Lifesciences, St. Jude Medical, and Sorin Group equally. Research funding to the Division within the past year include: AtriCure Inc, Boehringer Ingelheim, Bolton Medical, Carbomedics/Sorin Group, Edwards Lifesciences, Jarvik Heart, LAAX Inc, Medtronic, St. Jude Medical, Schering-Plough, Terumo Heart, The Medicines Company, Thoratec, and WL Gore and Associates. Current technology licensing agreements are with St. Jude Medical and Sorin Group.
Figure. A, Electrocardiography-gated computed tomography (CT) showing the aneurysm (*). B, Electrocardiography-gated CT showing a thin tissue rim between the aneurysm (*) and the LA. C, Electrocardiography-gated CT showing a gap (arrow) in the thin tissue rim between the aneurysm (*) and the LA. D, Preoperative transthoracic echocardiogram showing annular dilatation, mitral leaflet malcoaptation, and severe functional mitral valve regurgitation. E, Preoperative transesophageal echocardiogram demonstrating flow between the aneurysm and the LA. F, Intraoperative photograph showing further bifurcation of the left main coronary artery, demonstrated with probes passed down the left anterior descending and circumflex coronary arteries. G, Intraoperative photograph demonstrating erosion of the fistula into the dome of the LA. H, Intraoperative photograph demonstrating orifice of the fistula into the RA near the junction with the superior vena cava. I, Transesophageal echocardiogram showing absence of flow between the aneurysm and the LA after surgical correction. J, Postoperative electrocardiography-gated CT showing repair and absence of aneurysm. * indicates the aneurysm; CT, computed tomography; LA, left atrium; RA, right atrium.
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*Circulation*. 2011;124:2456-2457
doi: 10.1161/CIRCULATIONAHA.111.032706

*Circulation* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/124/22/2456

Data Supplement (unedited) at:
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