Demonstration of Inverted Left Atrial Appendage Using Cardiac Computed Tomography
An Unusual Complication Mimicking Left Atrial Mass After Cardiac Surgery
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An 18-year-old boy with aortic sinus dilatation, aortic regurgitation, and mitral regurgitation caused by cardiovascular involvement of the vasculitis was referred to our hospital for surgery. He underwent a Bentall operation and mitral valve replacement uneventfully. On preoperative echocardiography, left atrial appendage (LAA) appeared normal. There was no anatomic variation or abnormal mass in the left atrium seen on surgical inspection. Postoperative transesophageal echocardiography revealed a tongue-like, protruding mass in the left atrium cavity (Figure [A], and Movie I in the online only Data Supplement). The mass measured 17×13 mm and demonstrated mixed echogenicity with a low-echogenic outer layer and a central, high-echogenic portion. The mass was initially thought to be a thrombus mixed with a foreign body. ECG-gated cardiac computed tomography (CT) showed a lobulated, low-density, mass-like lesion in the left atrium, which arose from the anterolateral wall with a broad base and between the left upper pulmonary vein and the mechanical mitral valve (Figure [B and C], and Movie II in the online-only Data Supplement). The LAA was also not visible. These findings suggested the diagnosis of inverted LAA. The 3-dimensional, endoluminal CT view demonstrated the geometric relationship between the presumed inverted LAA and the mitral inflow tract, and no significant obstruction was seen (Figure [D], and Movie III in the online-only Data Supplement). There was also no flow acceleration in the mitral inflow. The patient was then symptom free and was discharged operatively, it invariably presents as an echogenic, left atrial mass on transesophageal or transthoracic echocardiography. Differential diagnoses include atrial myxoma, vegetation, or thrombus, with the last being more likely in a patient immediately postsurgery. The unusual area of blood clot formation and the absence of a long, tubular, pyramidal LAA shadow on echocardiography have made inverted LAA a more usual suspect.$^2$ Cardiac MRI has been used previously to diagnose this lesion by observing the mass extending from the LAA and having the same characteristics as the left atrial wall, although this may not be helpful in all patients.$^1,3$

CT findings of an inverted LAA have not yet been well established. In our patient, a lobulated, low-density mass was arising from the anterolateral wall of the left atrium and had a broad base, which was an unusual position for a thrombus. In particular, the normal LAA was not seen along the left atrioventricular groove. Demonstration of a geometric relationship between the inverted LAA and left upper pulmonary vein using 3-dimensional reconstruction may be helpful for making the correct diagnosis. Cardiac CT may be a good complementary imaging modality for diagnosis of this type of lesion when the echocardiographic findings are inconclusive.

Sources of Funding
This research was supported by Basic Science Research Program through the National Research Foundation of Korea funded by the Ministry of Science, ICT, and Future Planning (NRF-2013R1A1A058711).

Disclosures
None.

References

From the Department of Radiology and Research Institute of Radiology (G.Y.Y., D.H.Y., J.-W.K., T.-H.L.), Division of Cardiology (J.-K.S.), and Department of Cardiovascular Surgery (J.-W.L.), Cardiac Imaging Center, Asan Medical Center, University of Ulsan College of Medicine, Seoul, South Korea.
The online-only Data Supplement is available with this article at http://circ.ahajournals.org/lookup/suppl/doi:10.1161/CIRCULATIONAHA.114.010600/-/DC1.
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Circulation is available at http://circ.ahajournals.org DOI: 10.1161/CIRCULATIONAHA.114.010600 e66


*Figure.* Transesophageal echocardiography (A) shows a tongue-like mass (arrows) with central high-echogenic portion (asterisks) protruding to the left atrium. Cardiac computed tomography (CT; B and C) demonstrates a mass-like lesion with internal fat tissue (asterisks) and an air bubble (arrowhead) arising from the anterolateral wall of left atrium (LA) between the left upper pulmonary vein (LUPV) and the mechanical mitral valve (curved arrow). A 3-dimensional endoluminal view of the CT image (D) obtained during the diastolic phase reveals the inverted left atrial appendage (LAA; arrows) at the posterior aspect of the mitral inflow tract, and there is no significant obstruction. A follow-up CT scan (E) obtained 15 months later shows the normal LAA (arrows). Ao indicates ascending aorta; LCx, left circumferential artery; LV, left ventricle; and PA; pulmonary artery.
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_Circulation_. 2014;130:e66-e67
doi: 10.1161/CIRCULATIONAHA.114.010600

_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/130/8/e66

Data Supplement (unedited) at:
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