A 46-year-old asymptomatic woman with a history of breast cancer and chemotherapy treatment was referred for echocardiography examination as part of a preoperative assessment workup before orthopedic surgery to evaluate her left ventricular ejection fraction. Echocardiography showed a linear echodensity within the left atrium (LA) (Figure 1), but there was incomplete depiction of the spatial relationship between the echodensity and surrounding structures.

Cardiac magnetic resonance imaging was performed to further characterize this structure. The cardiac magnetic resonance imaging protocol included several pulse sequences: T1-weighted turbo spin echocardiogram, T2-weighted black blood image, and steady-state free precession cardiac magnetic resonance imaging, in addition to phase-contrast technique.

A single, membrane-like structure was seen traversing the LA cavity (Figure 2), extending from just below the fossa ovalis to the LA wall (Figure 3 and Movies I and II in the online-only Data Supplement). All pulmonary veins drained into the posterosuperior LA, except for the left upper pulmonary vein, which drained into the anteroinferior LA. The LA was dilated. Left ventricular systolic function was at the lower limits of normal (left ventricular ejection fraction, 56%), whereas right ventricular systolic function was normal. In addition, a bovine arch was detected (Figure 4).

Use of the phase-contrast technique in the sagittal oblique plane was planned to depict the size of the opening in the membrane (Figure 5), which determines the degree of obstruction to pulmonary venous return. An area of 2.4 cm² was traced, suggesting a hemodynamically insignificant obstruction.

Cor triatriatum is a rare cardiac malformation accounting for only 0.1% of all cardiac defects.¹,² Embryologically, cor triatriatum may be caused by failure of resorption of the common pulmonary vein, producing an LA divided by an abnormal fibromuscular membrane.³,⁴ Clinical presentation depends on the degree of restriction of blood flow from the upper chamber to the lower chamber of the LA through a fibromuscular membrane containing 1 or more fenestrations.⁵

The communication between the 2 divided atrial chambers may be large, small, or absent, depending on the size of the opening in the membrane. Elevations of both pulmonary venous pressure and pulmonary vascular resistance may result in severe pulmonary artery hypertension. Surgical resection of the membrane is the treatment of choice for patients with significant obstruction.⁶

Cor triatriatum is a rare cardiac malformation accounting for only 0.1% of all cardiac defects.¹,² Embryologically, cor triatriatum may be caused by failure of resorption of the common pulmonary vein, producing an LA divided by an abnormal fibromuscular membrane.³,⁴ Clinical presentation depends on the degree of restriction of blood flow from the upper chamber to the lower chamber of the LA through a fibromuscular membrane containing 1 or more fenestrations.⁵

The communication between the 2 divided atrial chambers may be large, small, or absent, depending on the size of the opening in the membrane. Elevations of both pulmonary venous pressure and pulmonary vascular resistance may result in severe pulmonary artery hypertension. Surgical resection of the membrane is the treatment of choice for patients with significant obstruction.⁶

Cor triatriatum is a rare cardiac malformation accounting for only 0.1% of all cardiac defects.¹,² Embryologically, cor triatriatum may be caused by failure of resorption of the common pulmonary vein, producing an LA divided by an abnormal fibromuscular membrane.³,⁴ Clinical presentation depends on the degree of restriction of blood flow from the upper chamber to the lower chamber of the LA through a fibromuscular membrane containing 1 or more fenestrations.⁵

The communication between the 2 divided atrial chambers may be large, small, or absent, depending on the size of the opening in the membrane. Elevations of both pulmonary venous pressure and pulmonary vascular resistance may result in severe pulmonary artery hypertension. Surgical resection of the membrane is the treatment of choice for patients with significant obstruction.⁶

Cor triatriatum is a rare cardiac malformation accounting for only 0.1% of all cardiac defects.¹,² Embryologically, cor triatriatum may be caused by failure of resorption of the common pulmonary vein, producing an LA divided by an abnormal fibromuscular membrane.³,⁴ Clinical presentation depends on the degree of restriction of blood flow from the upper chamber to the lower chamber of the LA through a fibromuscular membrane containing 1 or more fenestrations.⁵

The communication between the 2 divided atrial chambers may be large, small, or absent, depending on the size of the opening in the membrane. Elevations of both pulmonary venous pressure and pulmonary vascular resistance may result in severe pulmonary artery hypertension. Surgical resection of the membrane is the treatment of choice for patients with significant obstruction.⁶

Cor triatriatum is a rare cardiac malformation accounting for only 0.1% of all cardiac defects.¹,² Embryologically, cor triatriatum may be caused by failure of resorption of the common pulmonary vein, producing an LA divided by an abnormal fibromuscular membrane.³,⁴ Clinical presentation depends on the degree of restriction of blood flow from the upper chamber to the lower chamber of the LA through a fibromuscular membrane containing 1 or more fenestrations.⁵

The communication between the 2 divided atrial chambers may be large, small, or absent, depending on the size of the opening in the membrane. Elevations of both pulmonary venous pressure and pulmonary vascular resistance may result in severe pulmonary artery hypertension. Surgical resection of the membrane is the treatment of choice for patients with significant obstruction.⁶
veins. It also allows for precise measurement of the size of the membrane opening and hence determines the significance of the obstruction. In addition, it allows accurate assessment of cardiac function and chamber size, and it can detect any associated anomalies.

**Disclosures**

None.

**References**


**Figure 2.** Dark blood turbo-spin-echo magnetic resonance axial images (with 2 different window widths and levels) show a membrane (arrows) traversing the left atrium.

**Figure 3.** Cine magnetic resonance images using a steady-state free precession sequence clearly depict the membrane within the left atrium (arrows); 2-chamber (left) and 4-chamber (right) views.
Figure 4. Cine magnetic resonance image using a steady-state free precession sequence shows only 2 great vessels—instead of the normal three—originating from the aortic arch (a bovine arch).

Figure 5. Magnitude image (left) and corresponding phase-contrast image (right) in the sagittal oblique plane show the size of the opening in the membrane (arrows), which by tracing revealed an area of 2.4 cm².
Cardiac Magnetic Resonance Imaging Can Clearly Depict the Morphology and Determine the Significance of Cor Triatriatum
Abdalla A. Elagha, Anthon R. Fuisz and Gaby Weissman

Circulation. 2012;126:1511-1513
doi: 10.1161/CIRCULATIONAHA.112.105650
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2012 American Heart Association, Inc. All rights reserved.
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/126/12/1511

Data Supplement (unedited) at:
http://circ.ahajournals.org/content/suppl/2012/09/17/126.12.1511.DC1

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation is online at:
http://circ.ahajournals.org/subscriptions/