During a routine physical examination, a 37-year-old woman was noted to have a heart murmur. Her physician ordered a transthoracic echocardiogram for the presumptive diagnosis of mitral valve prolapse. Instead, the study showed a mass in the anterior wall of the left ventricle (Figure 1), with a question of a second mass involving the posterior papillary muscle. A transesophageal echocardiogram was performed, which again showed an anterior wall mass (Figure 2). The patient was scheduled for surgery to resect the mass; however, she requested a second opinion. A cardiac catheterization was performed, demonstrating normal right and left heart filling pressures, normal ventricular function, no significant coronary artery disease, and no abnormal neovascularization in the left ventricular chamber. A MRI was ordered for further evaluation.

Cardiac MRI showed a solitary, sharply marginated, bi-lobed mass arising from the endocardial surface of the left ventricle (Figure 3). No other masses were present. Regional wall motion near the mass was normal. The signal intensity of the mass was consistent with fat on several pulse sequences (Figures 3 and 4). First-pass perfusion imaging with MRI showed the mass was poorly perfused relative to normal myocardium (Figure 5).

The MRI findings were diagnostic of a benign lipoma. The patient elected not to undergo surgical resection of the mass. A follow-up MRI 10 months later showed the mass was unchanged in size and shape (Figure 6). Cardiac lipomas are benign tumors of encapsulated mature adipose cells. They are frequently subendocardial in location and account for ~11% of all cardiac neoplasms.1 MR signal characteristics of fat are quite specific, and they enabled cardiac MRI to be diagnostic in this case.

Reference

Figure 3. Cardiac cine images acquired with fat and water out-of-phase (A) and in-phase (B). Each lobe measures 12 × 3 mm. Mass has much lower signal intensity on out-of-phase image; this is consistent with it being composed of fat. Arrows indicate mass.

Figure 4. Long-axis MR images showing anterior wall mass (arrows). Signal intensity of mass mimics that of epicardial fat, which is bright on double-inversion recovery fast spin echo image (A) and dark on fat-suppressed triple-inversion recovery fast spin echo image (B).

Figure 5. Midventricular short-axis first pass perfusion MRI showing mass (arrow) does not become enhanced. This indicates that mass is poorly perfused relative to normal resting myocardium.

Figure 6. Follow-up study 10 months later demonstrates no change in size, shape, or position of mass. Short-axis cine MR images acquired with fat and water out-of-phase (A) and in-phase (B); long-axis double-inversion recovery fast spin echo image (C). Arrows indicate mass.
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