A previously healthy 65-year-old woman presented with palpitations and positional chest discomfort 3 weeks after she sustained chest wall trauma in a motor vehicle accident. Physical examination revealed occasional premature ventricular beats and low-grade fever. Her erythrocyte sedimentation rate was elevated (66 mm/h). Transthoracic and transesophageal echocardiography revealed a 3×3-cm, well-demarcated, homogeneous, round mass moving with the heart adjacent to the right atrium (Figures 1A, B). There was invagination of nearby cardiac chambers but no obstruction to right heart filling. MRI showed a circumscribed mass with dense tissue characterization (isointense to myocardium) not consistent with blood or fat (Figure 2A). There was minimal enhancement of the mass after gadolinium injection. Coronary angiography was normal. Two weeks later, the patient’s symptoms improved. Repeat transthoracic echocardiogram showed no change in size or consistency of the mass. A PET/CT (combined positron emission tomography and computed tomography) scan after administration of F-18 fluorodeoxyglucose (FDG) revealed focal intense activity adjacent to the right heart (Figure 2B), which correlated with a cardiac wall mass on the CT images. The distribution of F-18 FDG in whole-body imaging was otherwise unremarkable, and no additional abnormal masses were identified.

The patient underwent surgery. The pericardium was thin, with a small amount of cloudy pericardial fluid. A round, firm mass was detected, originating from the atrioventricular groove, attaching to the right atrium and free wall of the right ventricle, and encasing the right coronary artery (Figure 3A). The mass was excised without removing any portion of right atrium or ventricle. The right coronary artery was preserved by peeling the tumor from the vessel after the mass was divided into 2 halves (Figure 3B). Immunophenotyping by flow cytometry and tissue staining demonstrated that the malignant cells were positive for CD45, CD19, and CD20, and were negative for surface immunoglobulin. These findings were diagnostic of a diffuse large B-cell lymphoma (Figure 4). The pericardial fluid also showed evidence of lymphoma. A bone marrow biopsy obtained from the sternum at time of resection revealed benign lymphoid nodules and a mediastinal node adjacent to the pericardium was negative for lymphoma. The patient made an uneventful recovery from surgery, received systemic chemotherapy, and 1 year later remains in complete remission.

Figure 1. A, Transthoracic echocardiogram, apical 4-chamber view. Round mass adjacent to right heart (arrow) with invagination of right atrial wall and right ventricular inflow. B, Transesophageal echocardiogram: Well-demarcated mass (arrow) adjacent to the right atrium (RA). A linear structure with color Doppler flow (dashed arrow) is noted within the mass.
Figure 4. Microscopic pathology (hematoxylin-eosin stain, original magnification ×300) reveals packed sheets of large cells with round, lobulated nuclear contours, fine punctate chromatin, and distinct nucleoli. Frequent apoptotic cells, moderate number of mitoses, and areas of coagulation necrosis were present (not all represented in this image). Immunostaining for CD20 (insert) demonstrates a large B-cell lymphoma.

Figure 2. A, MRI, coronal multislice single shot. Round mass in the region of the right atrioventricular groove (arrow), isointense to the myocardium. B, F-18 FDG PET imaging, coronal view. Intense focal FDG activity (arrow) adjacent to the right atrium correlates with the round mass shown on the accompanying MRI image.

Figure 3. A, Intraoperative photograph of the well-circumscribed epicardial mass adherent to the right heart (arrow), enveloping the right coronary artery (dashed arrow). This vessel corresponds to the color Doppler signal noted on echocardiography in Figure 1B. B, Excised lesion (cut into halves) shows a smooth outer surface; the inner surface is indented (arrows) from passage of the right coronary artery.
Primary Lymphoma of the Heart
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