Intraventricular Masses Detected by Radionuclide Angiocardiology*

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Two patients are described in whom intraventricular tumors were incidentally detected by radionuclide angiocardiology. This finding led, in one patient, to surgical cure.

Intracardiac tumors may be clinically silent for variable periods of time and are often curable. Although radionuclide angiocardiology (RNA) is not the method of choice to investigate the presence or absence of intracardiac tumors, these tumors have been visualized using RNA.¹ ² Those reports described atrial tumors, almost exclusively,³ ⁷ with only one case in the English literature describing the presence of an intraventricular tumor⁴ which was localized in the right ventricle. We herein report two patients in whom intraventricular tumors were incidentally detected during RNA. One represents the first reported case of a left ventricular tumor detected by this technique.

**Case Reports**

**Case 1**

A 27-year-old man was admitted for investigation of syncopal episodes of ten weeks' duration. These episodes lasted about 30 seconds each and were often preceded by palpitations, diaphoresis and substernal chest pain. He experienced an average of one syncopal episode per week. During one such episode, an ECG revealed a wide QRS-complex tachycardia thought to represent ventricular tachycardia at a rate of 230 beats/minute. Physical examination was remarkable.

The 12-lead ECG revealed frequent ventricular extrasystoles, but it was otherwise unremarkable. Chest x-ray film findings were normal. A routine RNA, performed to exclude organic heart disease prior to electrophysiologic studies, showed a filling defect in the left ventricular cavity (Fig 1), more clearly seen in systole than in diastole. An echocardiogram demonstrated a 3 cm mass in the left ventricle attached to the anterolateral wall by a broad base. Contrast ventriculography and computed tomography confirmed the diagnosis of an intraventricular tumor. At surgery, a benign pedunculated rhabdomyoma (3.5 x 2.5 x 1.5 cm) was found attached to the anterolateral wall of the left ventricle. Since excision of the tumor, the patient has been free of syncope and ventricular tachycardia.

**Case 2**

A 69-year-old woman presented with a history of increasing dyspnea and atypical chest pain. She had had rheumatic fever at the age of 12 years. She had hypertension for 15 years and exertional dyspnea was present for one year. Four months prior to admission, cystoscopy and laparotomy revealed a leiomyosarcoma extending from within the left ureter to the bladder with widespread intraperitoneal extension. Venography revealed metastatic tumor within the inferior vena cava extending from the level of the right renal vein to the level of the diaphragm. Surgical debulking was not feasible.

On admission, her blood pressure was 160/90 mm Hg and the venous pressure was normal. The lungs were clear to auscultation. The cardiac apical impulse was diffuse and sustained. Both heart sounds were loud. She had a grade 2/6 systolic ejection murmur radiating from the left sternal border to the neck, a grade 2/6 apical pansystolic murmur, and an apical diastolic rumble with presystolic accentuation. The ECG showed left ventricular hypertrophy. RNA, performed to assess left ventricular function, revealed a large mass in the right atrium which clearly moved into the right ventricle during diastole (Fig 2 and 3). Echocardiogram and computed tomography confirmed the presence of a large mass which extended from the inferior vena cava to the right atrium and right ventricle. Neither the aortic nor mitral valve leaflets appeared to have rheumatic valvular disease. Surgery was not contemplated because of the advanced metastatic disease. She was treated with oral vasodilator drugs and discharged home, where she died suddenly two days later. No post-mortem examination was performed.

**Discussion**

Intracardiac tumors are potentially lethal but uncommon entities which may be clinically silent for variable periods of time. They are often benign and surgically curable. Thus, early detection of intracardiac tumor is important and re-

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intracardiac tumors were detected incidentally by RNA; one is the first case of left intraventricular tumor detected by this technique.

Due to the widespread use of RNA in the assessment of cardiac function, it is important for physicians who interpret these studies to be aware of the possibility of the incidental detection of intracardiac masses. Intraventricular filling defects on RNA could potentially arise from large papillary muscles, mural thrombi or tumors. In our experience, large papillary muscles have not resulted in filling defects on RNA when using the equilibrium blood pool technique. The differential diagnosis between clot and tumor, however, is not possible using this technique. In fact, the appearance of the radionuclide angiocardiogram in a patient with a large left ventricular mural thrombus reported by Gewertz et al. was similar to that of our first patient. The localization of a filling defect may be helpful in the differential diagnosis. If a filling defect is localized in an akinetic or diskinetic segment of the ventricle, it is most likely to represent a mural thrombus. Although the mass seen in the right atrium and right ventricle in our second patient might have represented a thrombus, it seems more likely to have been a direct extension of the metastatic leiomyosarcoma. Since no surgical or post-mortem specimens were obtained, however, we cannot be certain of the diagnosis.

We conclude that suspicious filling defects on RNA should probably be reported to alert the clinician to perform appropriate diagnostic procedures. Echocardiography is currently the method of choice for assessing intracardiac masses. However, the detection of a filling defect by RNA could, for some patients, be the first indication of an intracardiac tumor.

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REFERENCES


Detection of Intraventricular Masses (Sheldon, Manyari)