Echocardiographic Demonstration of Right Atrial Rupture in a Patient with Right-sided Cardiac Tumor*

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Two-dimensional echocardiographic evaluation of a young man with recent drainage of a hemorrhagic pericardial effusion revealed persistent fluid and a massive tumor involving the right atrium, tricuspid valve, and right ventricle. Echocardiographic demonstration of right atrial wall rupture was confirmed at surgery; pathologic analysis showed a spindle cell sarcoma.

Two-dimensional echocardiography has become an enormously valuable means of noninvasive evaluation of the heart in both intrinsic cardiac diseases and noncardiac disease states with cardiac involvement. Both primary and metastatic tumors have been reported in all four chambers, and several reports specifically on tumors of the right side of the heart.

The echocardiographic findings are reported of a rapidly growing spindle cell sarcoma involving the right side of the heart, which caused echocardiographically-visualizable right atrial rupture.

CASE REPORT

The patient was a 24-year-old black man in excellent health until the sudden onset of a nonproductive cough and sharp left-sided chest pain while he was working on a ship in the Caribbean. He was hospitalized in Panama, where on the fifth day, sudden clinical deterioration necessitated the surgical drainage of a hemorrhagic pericardial effusion. Several days later, acute abdominal pain and distension led to an exploratory laparotomy which found serous fluid and congestive hepatomegaly. The patient was transferred to us with the diagnosis of viral polyserositis.

Physical examination upon admission here revealed the following findings: blood pressure, 140/88 mm Hg, with a pulse paradoxic of 10; pulse, 100; respirations, 30; temperature, 37.6°C; decreased breath sounds at both lung bases; normal cardiac exam; a slightly distended abdomen with shifting dullness; and well-healing surgical incisions. The laboratory work-up was remarkable for a hematocrit value of 30.4 percent and a white blood cell count of 16,100/cu/mm (75 neutrophils, three bands, 16 lymphocytes, six monocytes). Electrocardiogram showed a sinus tachycardia. A left lower lobe infiltrate and enlarged cardiac silhouette were notable on chest x-ray film. The echocardiogram showed a small pericardial effusion and a large mass attached to the tricuspid valve and extending into a severely enlarged right atrium. There was no mass in the right ventricle.

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Figure 1. Parasternal, short axis view is shown. The large tumor mass (T) in right ventricle extends from tricuspid valve (TV) to pulmonic valve (PV) and into the pulmonary artery (PA) in systole. Ao is aorta; LA, left atrium; and RA, right atrium.

The patient left the hospital against medical advice, but returned four weeks later because of left flank pain. His physical findings were unchanged except for a 2/6 midystolic murmur along the left sternal border and tenderness and guarding in the left upper quadrant. A repeat echocardiogram was done, three days after which the patient was taken to surgery.

RESULTS

The echocardiogram during the patient's second hospitalization showed normal left-sided structures with hyperdynamic function. The right atrium and right ventricle were tremendously increased in size. The mass seen on the initial ultrasound study had more than doubled in size extending from the tricuspid valve not only back into the right atrium, but also growing along the wall of and into the right ventricle, its mobile portion extending beyond the pulmonic valve into the pulmonary artery during systole (Fig 1). There was a loculated pericardial effusion with numerous fibrous strands and a 2 cm mass on the parietal pericardium near the right atrium (Fig 2). The right atrial border at this area was discontinuous with shaggy edges.
tricuspid valve extending back into the right atrium and forward growing along the right ventricular wall and extending up the outflow tract to the pulmonic valve. Microscopic examination revealed a spindle cell sarcoma.

**DISCUSSION**

Two-dimensional echocardiography proved to be an immensely valuable tool in both discovering and following the progress of this extremely rapidly growing and destructive tumor.

Echocardiographic detection of rupture of the right atrium has not been reported previously. This unusual complication is important to detect if surgery is planned, so that the surgical team can be prepared to deal with it and avoid the large blood loss which will occur when the pericardial cavity is entered. As seen in Figure 2, the tumor growth along the right atrial wall most likely caused the destruction of its tissue and subsequent hemopericardium.

The use of cardiac ultrasound in detecting tumor masses has been well established. Here is shown a rapidly growing spindle cell sarcoma first found by echocardiography, and additionally demonstrated is a significant complication—right atrial rupture—on ultrasound. Detection of the latter preoperatively may be of considerable importance to the surgeon.

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**REFERENCES**

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**Aortico-Right Ventricular Shunt Following Aortic Valve Replacement**

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A 55-year-old man developed cardiac decompensation following aortic valve replacement as a result of an aortico-

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