

Case Reports

CAVERNOUS HEMANGIOMA OF THE RIGHT ATRIUM: Presumptive Diagnosis By Coronary Angiography

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The angiographic findings in a patient with an interesting vascular tumor of the right atrium are described. The tumor was supplied by vessels from both the right and left coronary arteries and consisted of dilated blood spaces in which contrast material persisted for a prolonged period of time.

Since this picture is identical to that described in cavernous hemangioma of other organs, this report presumably represents the first description of the angiographic findings in a cavernous hemangioma of the heart.

Key words: cardiac tumor, cavernous hemangioma, coronary angiography

INTRODUCTION

Cavernous hemangiomas of the heart are rare tumors. They are usually discovered incidentally at autopsy; to our knowledge, the angiographic description of this tumor has not been reported. We therefore describe a patient with a vascular tumor of the right atrium discovered during coronary angiography. The angiographic characteristics of this tumor are identical to those described in cavernous hemangiomas of other organs.

Case report

For 3 months prior to admission E.W., a 52-year-old white female, had noted increasing fatigue, substernal tightness, and mild dyspnea which would occur with exertion and last for 15 to 30 min. The patient had smoked one pack of cigarettes per day for 30 years and had a 7 year history of adult onset diabetes mellitus controlled with diet.

Physical examination revealed a well-nourished white female with a blood pressure of 130/70 and ventricular rate of 80. The physical examination was normal; in particular no significant cardiac murmurs were heard.

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TABLE I. Catheterization Data

	Pressure (mmHg)	O ₂ Saturation (%)
SVC		78
IVC		85
RA (mean)	2	82
RV	24/2	81
PA	24/10	82
PAW	3	
AsAo	120/78	95
LV	120/9	

AsAo = Ascending aorta

IVC = Inferior vena cava

LV = Left ventricle

PA = Pulmonary artery

PAW = Pulmonary artery wedge

RA = Right atrium

RV = Right ventricle

SVC = Superior vena cava

The electrocardiogram and chest x-ray were normal. Cardiac fluoroscopy demonstrated a curvilinear area of calcium in the region of the right atrial appendage. The echocardiogram was normal; in particular there was no evidence of right ventricular volume overload.

Cardiac catheterization was performed using the percutaneous femoral approach. Hemodynamic data and oxygen saturations are shown in Table I. The pressures were normal and there was no significant step-up in oxygen saturation detected in the right heart. Left ventricular angiography was performed with the patient in the 30° right anterior oblique position. The left ventricle was of normal size and left ventricular contraction was normal. The ejection fraction was 68%. Coronary angiography revealed normal coronary arteries. However, a large vascular tumor was seen in the area of the right atrial appendage. This tumor was supplied by large, normal-appearing vessels from the left anterior descending, left circumflex, and right coronary arteries (Figs. 1,2), and consisted of large vascular channels which retained contrast material for a prolonged period of time (Fig. 3). The tumor was well circumscribed with a calcified superior margin. There was no evidence of vascular encasement and the vessels supplying the tumor appeared to taper normally.

In order to localize this tumor further, contrast material was injected into the superior vena cava. The right ventricle, left atrium, and left ventricle were normal. There was a filling defect in the area of the right atrial appendage. (Fig. 4).

After completion of the right coronary angiograms a Swan-Ganz thermodilution catheter was positioned high in the right atrium; when 5 ml of cold saline was injected into the right coronary artery, the thermistor in the right atrium registered almost immediate temperature change, indicating a rapid left to right shunt through the tumor.

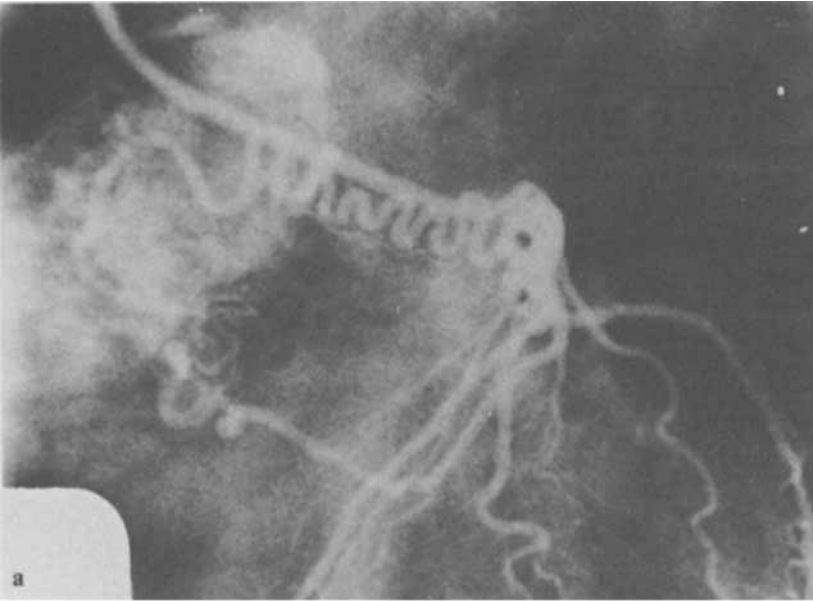


Fig. 1a. LCA in LAO projection. The coronary arteries are normal. A large vascular tumor lies anteriorly and is supplied by 2 vessels. The upper vessel arises from the LAD while the lower vessel originates from the LCCA. This is best seen in the RAO projection (Fig. 1b). (LAD = left anterior descending coronary artery; LAO = left anterior oblique; LCA = left coronary artery; LCCA = left circumflex coronary artery; RAO = right anterior oblique.)

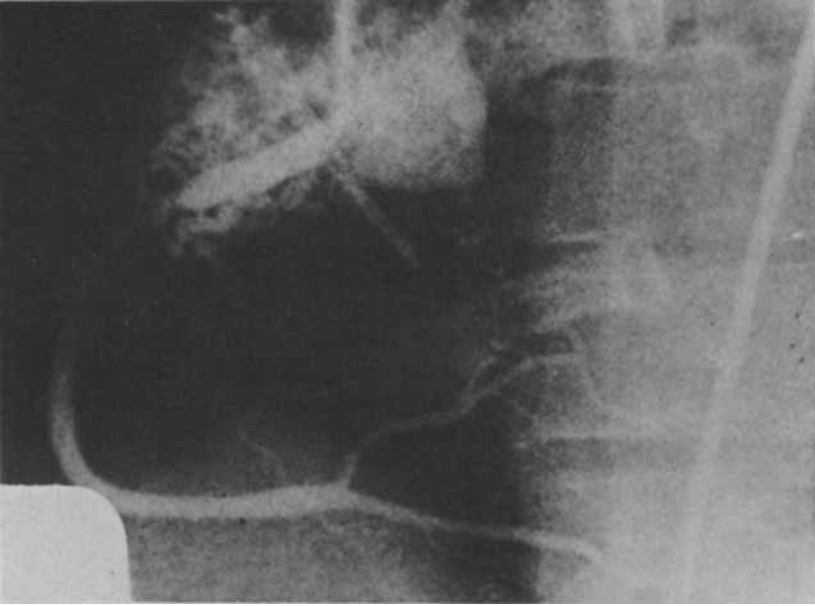


Fig. 2. RCA in LAO projection. The tumor is also supplied by the RCA and consists of large dilated blood spaces. (RCA = right coronary artery.)

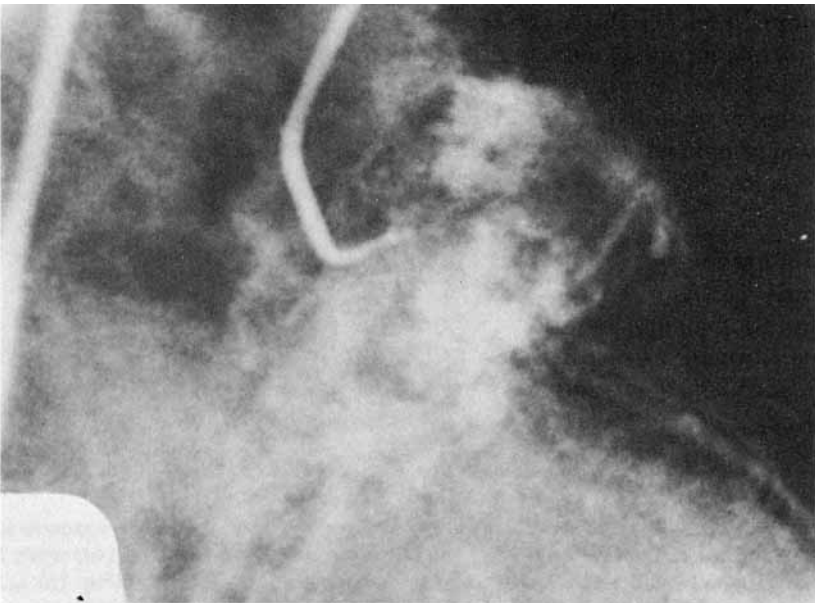


Fig. 3. LCA in RAO. Contrast material remains in the tumor after it has been cleared from the LCA and its branches.

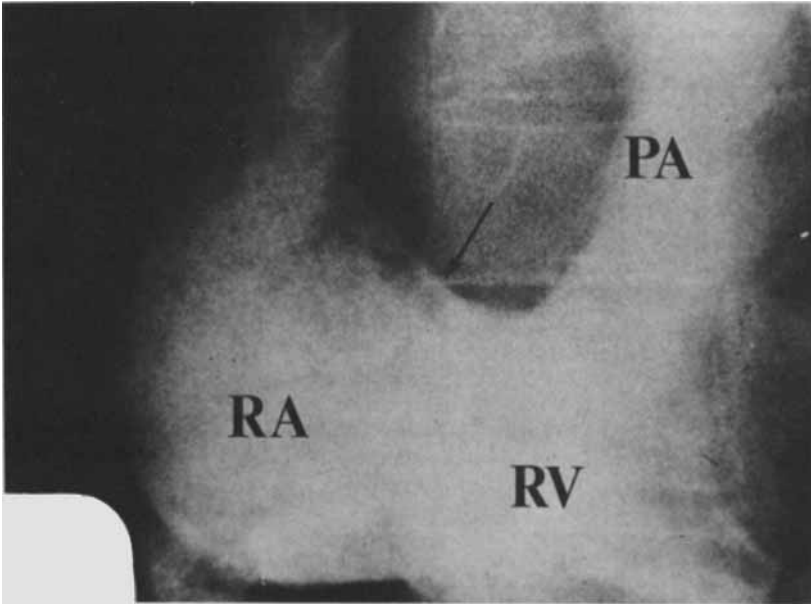


Fig. 4. The right atrial appendage (arrow) contains no contrast material despite the fact that enough contrast material has been injected to fill the right atrium (RA), right ventricle (RV), and pulmonary artery (PA).

When the patient was reexamined after the catheterization results were known, A Gr I/VI continuous, high-pitched murmur could be heard in the third intercostal space at the left sternal border with the patient in the standing position.

DISCUSSION

Cavernous hemangiomas are exceedingly uncommon primary cardiac tumors. Mahaim (1), in 1945 and Pritchard (2) in 1951 were able to find 5 cases in the world literature. In 1964 Peychl (3) reported a cavernous hemangioma of the left ventricle and described 17 other reported cases. A review of the literature now reveals an additional 5 patients (2,6,7,8,9). Our case is thus the 24th report of a cavernous hemangioma of the heart.

Table II outlines some of the characteristics of these cases. The tumor occurs in all age groups with a marked male predominance. The right atrium is the most frequent site. In approximately 50% of the cases the patients are asymptomatic. However, intracavitary tumors can produce valvular insufficiency (3) or obstruction (6,7). In the case reported by Grant (9), a septal tumor destroyed the bundle of His and produced complete atrioventricular block. Of interest is the case reported by Panbruccian (7) of a 55-year-old male who presented with the clinical and electrocardiographic picture of an acute anteroseptal myocardial infarction. At autopsy he was found to have a cavernous hemangioma of the interventricular septum and no evidence of a recent infarction. Our patient presented with chest

TABLE II. Reported Cases of Cardiac Hemangiomas

Author	Sex	Age	Location	Symptoms
Uskow ³	?	?	Heart	?
Czapek ⁸	M	56	Subepicardial left ventricle	0
Borchow ³	M	61	Left atrium	Mitral insufficiency
Bostroem ³	?	3 weeks	Right atrium	Cyanosis
Rau ²	M	56	Right atrium	0
Train ²	M	78	Left atrium	0
Koch ⁸	M	51	Subepicardial interven- tricular sulcus	0
Eichtweiss ⁸	M	54	Right atrium	0
Schuster ²	?	1 month	Right ventricle (papillary muscle)	0
Manifold ³	F	54	Left atrium	Harsh murmur, seizures
Runge ³	?	10 days	Subepicardial left ventricle	0
Soria ⁷	F	42	Left atrium	Mitral stenosis
Grant ⁹	M	39	Septum	Complete heart block
Link ³	F	"old"	Right atrium	Abnormal EKG
Greenberg ¹⁰	M	63	Subepicardial atrio- ventricular sulcus	0
Hochberg ¹¹	F	8	Right atrium	Fatigue, dyspnea
Pritchard ²	M	38	Right atrium	0
Reiner ⁸	M	61	Subepicardial right ventricle	0
Psychl ³	M	70	Subepicardial left ventricle	Congestive heart failure
Baroldi ⁴	M	24	Right atrium	Congestive heart failure
Plemenac ⁵	M	37	Right atrium	0
Delaye ⁶	M	23	Right ventricle	Congestive heart failure, pulmonic stenosis
Pambuccian ⁷	M	55	Septum	Myocardial infarction
Raabe	F	52	Right atrium	Chest pain, abnormal chest x-ray

pain which had some of the characteristics of angina pectoris. We do not believe that her pain is due to coronary insufficiency secondary to the tumor since the left to right shunt through the tumor is small and unlikely to cause a "coronary steal" syndrome.

In only 3 previous cases has the diagnosis of a "cardiac tumor" been made pre-mortem; in each instance the type of tumor was discovered only by thoracotomy or at post-mortem (4,6,11.) In 2 of these 3 cases the tumor was removed at operation. In Hochberg's case (11) a large tumor involving the epicardium of the right atrium and the overlying pericardium was successfully removed, and in the case reported by Delaye (6) a pedunculated tumor was removed from the right ventricle with relief of right ventricular outflow obstruction. Because of our patient's relative lack of symptoms and because the extensive blood supply of this tumor would make excision difficult, we have elected not to advise operation.

Although histologic proof is unavailable, we have no doubt that this tumor is a cavernous hemangioma. It has all of the angiographic characteristics of cavernous hemangioma as it has been described in other visceral organs (12,13,14 (i.e., a well-circumscribed vascular tumor supplied by normal-appearing arteries, consisting of dilated blood spaces in which contrast material persists for a prolonged period of time). It does not show the angiographic characteristics of the malignant hemangiosarcoma as described by Moss, et al. (15) Presumably, therefore, this case represents the first reported instance of a cavernous hemangioma of the heart diagnosed by coronary angiography.

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