Primary Angiosarcoma of the Heart


Summary
An unusual case of primary angiosarcoma of the left atrium in a heart with chronic rheumatic valvulitis is described. The tumor which was detected at autopsy 2 years after the second valvotomy operation was restricted to the endocardium only and metastasized to the brain.

Additional Indexing Words:
Left atrial endocardium  Rheumatic mitral valvulitis  Mitral valvotomy  Metastatic nodules in brain

Primary tumors of the heart are rare and of these angiosarcoma constitutes a minority.1)–8) This tumor almost invariably occurs in the right side of the heart, frequently in the right atrium and in the visceral pericardium. Only 3 cases of this tumor occurring in the left atrium have so far been reported.9)–10)

We report an unusual case of angiosarcoma of the heart restricted only to the left atrial endocardium that was detected at autopsy following 2 mitral valvotomy operations for chronic rheumatic disease. A metastatic tumor nodule was detected in the right temporal lobe. On careful search, no other tumor was found in the body to account for the primary site.

Case Report
A 38-year-old male patient was first seen in July 1962 in the cardiac clinic of the All India Institute of Medical Sciences Hospital with the complaints of exertional dyspnea, palpitation, and ankle edema for 1 year. He was in the functional class III disability of the New York Heart Association Classification. He also had occasional attacks of hemoptysis. There was no history of rheumatic fever in the past. On examination, the patient was in normal sinus rhythm and had normal blood pressure. He had evidence of congestive heart failure and classical clinical auscultatory findings of tight mitral stenosis with tricuspid regurgitation. The electrocardiogram revealed presence of biatrial overload with right ventricular hypertrophy pattern. Cardiac catheterization study revealed presence of severe pulmonary venous and arterial hypertension and significant narrowing...
of the calculated mitral valve area. A closed mitral commissurotomy was performed in August, 1962. The patient showed a remarkable recovery after the surgery and remained asymptomatic for 10 years following the operation. In 1972, he again became symptomatic and his symptoms progressed to the class IV by 1975. Physical examination showed evidence of severe mitral restenosis with tricuspid regurgitation and basal insufficiency. A repeat cardiac catheterization study in March 1975 revealed presence of severe pulmonary arterial hypertension, normal left ventricular diastolic pressure, mild aortic regurgitation, and reduced cardiac output. The pulmonary arterial wedge pressure could not be obtained but on fluoroscopy the mitral valve appeared calcified. The patient underwent another closed transventricular mitral valvotomy in September, 1975. At the time of surgery, the valve was found to be densely calcified, the posterior cusp showing more severe involvement than the anterior cusp. The valve orifice was critically narrowed measuring less than 5 mm in diameter. The commissures were free from calcification and an effective valvotomy was achieved. The patient remained well for 2 years following the second surgery after which he started having low grade fever lasting for about 3 months. Repeated blood cultures for bacteria, anaerobes and fungi were sterile. The patient also developed congestive heart failure and was treated with decongestive therapy and various broad spectrum antibiotics in large doses, but his fever did not subside. In May, 1977 he developed suddenly left sided hemiparesis with dysphasia. His general condition kept on deteriorating gradually. He became markedly anemic and showed poor response to symptomatic therapy. On July 7, 1977 the patient suddenly went into deep coma and died on the same day.

Pathology:

Autopsy was performed 2 hours after death. The heart weighed 500 Gm and was markedly enlarged. The left atrium was dilated. There was a large, soft, friable growth, 5 cm in diameter, covering almost the entire endocardial surface of the chamber (Fig. 1), leaving a centimeter wide linear strip of the atrial wall on the posteromedial aspect and encroaching on to the atrial surface of both the mitral cusps and the openings of the pulmonary veins. The growth measured approximately 6-8 mm in average thickness and presented a rough, coarsely granular surface on which fresh blood clots were adherent. Cut surface of the tumor appeared dark brown. The mitral valve opening was stenosed measuring 4 mm in diameter. The cusps were distorted with thickening, fibrosis, and calcification. There was marked thickening and shortening of the chordae tendineae. The aortic valve also showed features of chronic valvulitis with commissural fusion, rolling up of the edges, and thickening of the cusps. There was mild atherosclerosis of the aorta and pulmonary artery. The pericardium had fibrous adhesions resultant from previous surgery.

The tumor was microscopically composed of round, polygonal and spindle shaped cells with moderate to scanty pink cytoplasm and pleomorphic vesicular nuclei having prominent nucleoli (Fig. 2). Some nuclei appeared hyperchromatic and several tumor giant cells were also seen (Fig. 3). Mitosis was infrequent. At places the tumor cells lined anastomosing channels, some of which contained red cells in the lumen (Fig. 3). Intraluminal papillary projections were also evident in some areas. The tumor involved the entire thickness of the endocardium ex-
Fig. 1. Gross appearance of tumor in the left atrium covering almost the entire endocardial surface and encroaching on to the surface of the sclerosed mitral valve (H & E).

Fig. 2. Tumour restricted to the endocardium of left atrium (left half, H & E, ×30). Markedly pleomorphic tumor cells are lining along cleft like spaces (right half, H & E, ×360).
Fig. 3. Microphotograph of the left atrial endocardium shows many of the spaces lined by tumor cells. Some spaces contain erythrocytes. Tumor giant cells (arrow) are also seen (H & E, ×400).

Fig. 4. Hemorrhagic tumor in the right cerebral hemisphere (top). Prominent papillary arrangement of tumor cells in the brain (middle, H & E, ×200). The vascular pattern of the tumor is very pronounced (bottom, reticulin, ×320).
cept for a narrow zone of connective tissue separating it from the underlying myocardium (Fig. 2). At no place, in several sections studied, could tumor infiltration be demonstrated either into the myocardium or the pericardium. Sections from different cardiac valves showed histological features of chronic rheumatic disease.

The brain appeared asymmetrical with enlargement of the right cerebral hemisphere. Coronal sections revealed a well circumscribed, soft, hemorrhagic area with a diameter of 3 cm extending from the right parietal to the occipital lobe (Fig. 4). Microscopically, tumor cells identical to those in the left atrium were seen. Intraluminal papillary projections, the vascular pattern of the tumor and hemosiderin deposition were however more pronounced than in the heart (Fig. 4). A diligent search for a possible primary site elsewhere in the body yielded no results. However, small aseptic infarcts were present in the kidney and spleen. With the above findings, we interpret the tumor to be arising from the heart, exclusively confined to the endocardium with a metastatic deposit in the brain.

**Discussion**

The pathologic features of the present case justify the diagnosis of a primary angiosarcoma of the heart with metastasis to the brain, since no other organ or tissue in the body showed tumor, and since the involvement of the left atrium was extensive. We believe that the focus of tumor in the brain is a secondary nodule from the primary site in the heart.

Of the primary sarcoma of the heart, angiosarcoma is the least common. The age ranges from 12–69 years, though most of the cases clinically are in the third and fourth decade of life as in the present case. Median survival time from the onset of symptoms is 3 months. In 73% of the cases it originates in the right atrium, less frequently the tumor is in the pericardium or the right ventricle and extremely rarely it involves the left atrium. Rheumatic heart disease has never been seen in association with any of the 60 cases reviewed except for the case reported by Englehart who died of mitral stenosis and a left atrial intracavitary tumor was incidentally found at autopsy. Our case is the second one on record with this type of association.

The clinical picture produced by an angiosarcoma is strikingly similar in all cases but frequently the diagnosis is delayed and, in most cases, is not made until autopsy. In our case, the tumor produced a clinical picture simulating to that of culture-negative infective endocarditis on the basis of chronic rheumatic mitral stenosis.

The unusual feature of the tumor in our case is its exclusive limitation to the endocardium of the left atrium. The single reported case of left atrial tumor in a rheumatic heart, presented as a polypoid intracavitary mass but had no metastasis. To our knowledge no case of angiosarcoma limited only to the endocardium has been reported. This patient was operated twice for
mitral valvotomy and it is possible that reparative growth of endothelial cells may later have progressed to neoplasm. Situations of this type, where chronic long standing irritation of tissue is subsequently followed by development of malignant neoplasm, are not unknown in the human. In a recently reported experimental study Lie et al\textsuperscript{11}) described an angiofibromatous tumor like lesion in the pericardium of a dog 3 months after coronary bypass surgery. It is unlikely that the tumor in our case was present at the time of the second surgery and it is possible that it attained to a significant size only after this operation.

Angiosarcoma most often metastasizes to lungs, lymphnodes, and liver\textsuperscript{1,4,6,12}). The brain is an uncommon site of metastatic involvement occurring in one series in only 2 out of 41 patients\textsuperscript{1}). Cerebellar and mid-brain metastasis may cause death before sufficient cardiac dysfunction develops. In this patient the primary cause for the terminal event was probably metastasis to the brain because his cardiovascular status remained fairly stable almost till the end.

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\textbf{References}

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