Small Cardiac Hemangioma: A Challenge for Diagnosis and Dilemma for Management

Yihua Liu, MD, Pablo Maureira, MD, PhD, Christine Selton-Suty, MD, Thierry Folliguet, MD, PhD, Pierre-Yves Marie, MD, PhD, Damien Mandry, MD, PhD, Jean-Pierre Vilemout, MD, PhD, Nguyen Tran, MD, PhD, and Virginie Cahn, MD

Departments of Cardiovascular Surgery and Heart Transplantation, Cardiology, Medical Imaging, and Anatomopathology, CHU-Nancy, Nancy; and Université de Lorraine, Nancy, France

A small cardiac tumor in the left ventricle was discovered incidentally in a 53-year-old patient by echocardiography and was further confirmed by magnetic resonance imaging. A clinical diagnosis of “fibroelastoma or myxoma with an atypical location?” was made, and an uneventful surgical resection was carried out in consideration of the potential embolic risk. The histologic analysis revealed a capillary hemangioma. A posteriori, we reviewed the coronary angiography performed 2 years earlier and found a typical “tumor blush” sign. We discuss the diagnostic features of this case and the alternative approaches that could have been chosen, including a conservative approach with close follow-up.

Ann Thorac Surg 2014;97:e11–3
© 2014 by The Society of Thoracic Surgeons

H emangiomas of the heart are very rare benign cardiac primary tumors. According to the size, location, and mobility, the patient can be asymptomatic or can present symptoms of intracardiac obstruction. The diagnosis relies mostly on different imaging modalities such as echocardiography, computed tomography / magnetic resonance imaging (MRI), or cardiac angiography. The natural history of cardiac hemangiomas is undetermined. There is no consensus on the treatment strategies for asymptomatic patients. We present our experience of the management of an asymptomatic small cardiac capillary hemangioma and discuss thereafter its features in different imaging modalities and the therapeutic options.

A 53-year-old patient was followed up by his cardiologist for primary arterial hypertension; no tumor or infectious previous diseases were noted in this patient. Transthoracic echocardiography revealed a small mobile mass, 7.4 × 9.9 mm (Figs 1A, 1B) attached to the inferolateral wall of the left ventricle through a short stalk; the mitral apparatus was not involved, and the ejection fraction was normal. Cardiac MRI was performed for the purpose of tissue characterization, but the atypical appearance of the tumor on MRI could not allow further differentiation because of a signal close to that of normal myocardium on different sequences along with a mild enhancement. After panel discussion, a diagnostic of fibroelastoma was suspected, and a decision for surgical resection was made in consideration of the potential embolic risk and the low operative risk (Euroscore 1.51%).

The tumor was approached through a left vertical atriotomy and through the mitral valve. A complete resection was performed without difficulty, and no mitral repair was needed. The recovery was uneventful, and echocardiography before discharge showed no residual intracardiac mass or mitral regurgitation. Histologic analysis revealed a capillary hemangioma (Figs 2A, 2B). A posteriori, we reviewed the coronary angiography performed 2 years earlier in the context of a positive stress electrocardiogram; a characteristic “tumor blush” sign was found, and the first septal artery was identified as the feeding vessel.

Comment

Primary cardiac neoplasms are a rare entity, with an incidence of 0.001% to 2.8% in unselected autopsy and surgical series. Benign cardiac tumors represent about 75% of primary cardiac tumors, and cardiac hemangiomas account for 5% to 10% of benign cardiac tumors [1, 2]. The clinical manifestations are quite heterogeneous according to the tumor’s anatomic characteristics; intracardiac obstructions with congestive heart failure, arrhythmia, coronary insufficiency, pericardial effusion, or exertion dyspnea have been reported as the initial symptoms [3]. Theoretically, unlike myxoma and papillary fibroelastoma, which have considerable friable acellular components, the embolic risk of cardiac hemangiomas may be lower. The clinical diagnosis of cardiac hemangiomas relies mostly on different imaging techniques. Transthoracic/transesophageal echocardiography is the first-line imaging test, which provides detailed anatomic information about the tumor and evaluation of cardiac function. Cardiac MRI is the reference imaging technique; its inherent soft-tissue contrast resolution and high spatial resolution allow tissue characterization and anatomic assessment. Generally, the MRI features of cardiac hemangiomas are isosignal and hypersignal on T1-weighted and T2-weighted images, respectively; avid first-pass enhancement caused by its highly vascular structure; the cine steady-state free precession sequences allow evaluation of the tumor’s mobility [4]. Multidetector computed tomography is an alternative in patients with contraindications to MRI. Coronary angiography is not a routine imaging technique for the diagnosis of cardiac tumors, but it typically shows a tumor blush (Fig 1E) and maps the feeding vessel [2].

In our case, the precise preoperative diagnosis was proved to be difficult for several reasons. First, the tumor’s anatomic characteristics are important. Its intracavitary location, small size (<10 mm), and great mobility determine the nonsuperior diagnostic values of MRI over...
echocardiography. Second, limited by the spatial resolution of MRI, the tumor’s appearance on MRI was atypical. Its signal intensity was very similar to that of surrounding myocardium in “black blood” and steady-state free precession sequences. It presented a rapid heterogeneous enhancement in first-pass perfusion and a mild delayed enhancement (Figs 1C, 1D). A posteriori, we could ascribe this phenomenon to its highly capillarized structure and slow internal blood flow, which manifested as quick contrast medium uptake and slow washout. Third, we relied on the report of coronary angiography concluded as “normal,” and we reviewed intuitively the coronary angiograph before operating to eliminate coronary artery diseases but ignored the underlying “tumor blush” sign.

For symptomatic patients with resectable cardiac hemangiomas, radical surgical resection is indicated to relieve the tumor’s space-occupying effect, prevent major complications, and make a definitive diagnosis by obtaining histologic proofs. But for asymptomatic cardiac hemangioma without structural or functional involvement, the surgical indication remains controversial [3, 5].

The natural history of cardiac hemangiomas is unpredictable; they may involute, stop growing, or proliferate indefinitely [6]. The uncertainty complicates the prognosis and treatment. Meanwhile, surgical resection is not without risks. Except for the frequent complications associated with open heart surgical procedures, such as valvular regurgitation and conduction disturbance, intracardiac fistula is a rare but potential complication if the feeding artery is gross and is not ligated during operation. A late recurrence of cardiac hemangioma in a previous implantation site after complete resection has also been reported [7]. In our opinion, the surgical indication for cardiac hemangiomas in asymptomatic patients should be individualized. After comprehensive analysis of the tumor’s anatomic characteristics, potential complications, and biological behavior, a decision of close follow-up or timely operation based on risk stratification can then be made. In our case, in consideration of the small size of tumor, no functional involvement, and no significant growth during 2 years, simple close follow-up could have been an alternative strategy.

Fig 1. Features of a small cardiac hemangioma in different imaging modalities. (A) Four-chamber view of transthoracic echocardiography depicting a small mobile hyperechogenic mass in the left ventricle. (B) The mass was 7.4 × 9.9 mm with transesophageal echocardiography. (C) Sagittal image of the fast imaging employing steady-state acquisition sequence (FIESTA) demonstrating a small tumor with intermediate signal intensity attached to the inferior wall of the left ventricle by a thin stalk (white arrow). (D) Left ventricular outflow tract view of the FIESTA sequence with gadolinium injection showing a rapid heterogeneous enhancement (white arrow). (E) Coronary angiography showing the “tumor blush” sign (white arrow).

Fig 2. Histologic analysis. (A) Histologic section (hematoxylin and eosin, ×100) showing capillaries of various sizes lined by endothelium with loose matrix. (B) Immunohistochemical test result demonstrating CD31 and CD34 positive cells (endothelium) rimming the capillaries.
Conclusion

Cardiac hemangioma is a rare entity of benign cardiac tumors. Transthoracic/transesophageal echocardiography, multidetector computed tomography, MRI, and coronary angiography are helpful for diagnosis. For asymptomatic patients, either complete surgical resection or close follow-up may be a therapeutic option according to the tumor’s anatomic and biological characteristics and the patient’s risk stratification.

References