

Echocardiographic Features of Right Ventricular Cavernous Hemangioma: A Rare Case

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Abstract

Background: Cardiac cavernous hemangiomas are rare primary tumors of the heart. Echocardiography can determine their size, morphology, location, and mobility, and the compression caused by them.

Case presentation: We here present a case of a 41-year-old woman with atypical chest discomfort of 2 months duration and display her echocardiographic images. Final postoperative histopathological examination of the surgical specimen confirmed cavernous hemangioma of the right ventricle. In this rare case, we have described the echocardiographic features of a cavernous hemangioma involving the right ventricle.

Keywords: heart neoplasms, cavernous hemangioma, ventricle, right, echocardiography

Introduction

Primary cardiac tumors are rare, their estimated frequency being only 0.001%–0.300% at autopsy [1], and 75% of them are benign, examples being myxomas, hemangiomas, and fibromas. The rarest of these are cardiac hemangiomas, which

account for only 2% of primary cardiac tumors [1]. Histologically, cardiac hemangiomas are divided into three subtypes: cavernous, capillary, and arteriovenous hemangiomas [2].

Because the clinical manifestations of cardiac hemangiomas are complex and diverse, there are no typical symptoms to prompt diagnosis of this disease [3]. Echocardiography is the most useful diagnostic modality for cardiac tumors, its diagnostic rate being 94% for non-necropsy cardiac tumors [4]. Of course, the final diagnosis still depends on pathological findings.

Case presentation

A 41-year-old woman presented to our hospital with atypical chest discomfort of 2 months duration. She was previously healthy and denied hypertension, coronary heart disease, and other cardiovascular diseases. Physical examination showed blood pressure of 120/80 mmHg (1 mmHg = 0.113 kPa), heart rate 72 beats per minute, and a grade II–IV contraction murmur in the pre-cardiac area. Electrocardiogram showed sinus rhythm and was normal. Chest X-ray films revealed no abnormalities.

Echocardiography showed a solid $5.1 \times 3.5 \times 5.3$ cm mass with a wide base attached to the myocardium of the right ventricular free wall. The boundary between the tumor and the myocardium was indistinct. The mass oscillated slightly with the cardiac cycle. Internal echogenicity was medium and heterogeneous, and point-like calcification was noted. No blood flow signals were detected within the tumor. The right ventricular outflow tract was slightly obstructed, there was slight tricuspid valve regurgitation, and the left ventricular ejection fraction was 63%. We diagnosed right ventricular tumor (Fig. 1).

The mass was successfully removed. It was found to be located in the right ventricular wall, consistent with the preoperative echocardiography findings. The mass appeared red and soft, and the boundary between the tumor and myocardium was indistinct (Fig. 2). Histopathologic examination of the excised mass showed it was an angiogenic tumor with focal calcified nodules and a small amount of degenerated myocardial tissue, resulting in a diagnosis of cavernous hemangioma.

The patient recovered uneventfully and reported no marked discomfort when reviewed by telephone follow-up 2 postoperatively.

Discussion

Cardiac cavernous hemangiomas can occur in any part of the heart, including the endocardium, myocardium, epicardium, and pericardium [5]. Our patient's cavernous hemangioma was located in the right ventricular wall and the boundary between it and the surrounding myocardium was indistinct. Patients usually present with nonspecific symptoms, including chest pain, palpitations, exertional shortness of breath, syncope, and arrhythmia, the nature and severity of these symptoms being related to tumor size, anatomical location, and extent of involvement. In addition to nonspecific manifestations, embolism and compressive obstruction may occur. Thus, the patient's clinical symptoms do not usually provide meaningful diagnostic information [3].

Imaging examinations can provide information that enables diagnosis of cardiac cavernous hemangioma, echocardiography being the best diagnostic modality. Echocardiography can provide information about the size, shape, and location of the heart tumor, its relationship with surrounding structures, and its effect on cardiac hemodynamics, and is therefore helpful for preoperative diagnosis [6]. These lesions most often show "homogeneous solid tumor signs" in two-dimensional echocardiography and can manifest as hypo, medium, high, and mixed-echoic [7]. Heart tumors may have clear boundaries [7] or be tightly connected to the myocardium with indistinct boundaries. In addition, tumors characteristically oscillate with the cardiac cycle. Color Doppler echocardiography can detect blood flow signals in the tumor, obstruction of the heart cavity, and valve regurgitation of varying degree [8]. We performed echocardiography on our patient. This showed: (1) a solid soft-textured mass with ill-defined borders and a wide base attached to the right ventricular myocardium; (2) medium echoic, heterogeneous echo pattern with calcification; and (3) no blood flow signal in the tumor.

Although echocardiography can provide a wealth of information about cardiac tumors, the nature of those tumors and their tissue of origin cannot be determined by

this modality. The final diagnosis of heart tumor type must rely on postoperative pathological examination.

Conclusion

In this rare case, we have described the echocardiographic features of a cavernous hemangioma involving the right ventricle, thus further contributing to the imaging characteristics of cardiac cavernous hemangiomas.

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ETHICS STATEMENT

The author states that she has obtained appropriate institutional review board approval with written informed consent from the subject. Informed consent was obtained from the patient in order to publish the case report.

Author Contributions Statement

The authors performed image acquisition and completed the manuscript.

Conflict of Interest Statement

None declared.