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Giant Cardiac Cavernous Hemangioma Diagnosed with Contrast-Enhanced Ultrasound: A Case Report

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ABSTRACT

Presently, there are few reports in the database about a contrast-enhanced ultrasound-assisted diagnosis of cardiac cavernous hemangioma. We report a case of giant cavernous hemangioma of the heart, which was diagnosed using contrast-enhanced ultrasound. Finally, it was confirmed by surgical pathology. This case demonstrates that contrast-enhanced ultrasound can play an important role in the diagnosis of cardiac cavernous hemangioma.

INTRODUCTION

Cavernous hemangioma of the heart is an extremely rare primary benign cardiac tumor [Gao 2020; Li 2013]. There are few reports on the application of contrast-enhanced ultrasound (CEUS) in the diagnosis of cavernous hemangioma of the heart. Cavernous hemangioma of the heart is usually supplied by coronary artery branches, which provides a basis for the diagnosis of cardiac cavernous hemangioma using CEUS [Nakamura 2019]. We report the case of a 64-year-old woman with dizziness as the main symptom. Two-dimensional echocardiography revealed a substantial mass in the right ventricle. CEUS revealed a clear boundary and abundant internal blood supply, which was confirmed by pathology after surgery as cavernous hemangioma. The patient recovered well postoperatively, and no recurrence of hemangioma was found by transthoracic echocardiography at one year of follow up. This case proves that CEUS is obviously referential to the diagnosis of cardiac cavernous hemangioma.

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CASE REPORT

A 64-year-old woman presented with dizziness as the main symptom. The body temperature, respiration, blood pressure, and pulse were normal. There was no special medical history and no significant recent changes in body weight. Physical examination showed no obvious abnormality. The electrocardiographic findings were basically normal.

Transthoracic echocardiography was performed, from apical four-chamber view, subcostal four-chamber view, parasternal left ventricular short-axis view of the aortic valve level, and long-axis view of the parasternal right ventricular inflow tract showed a 32mm×35mm solid lesion in the right ventricle. It was attached to the right ventricular free wall, with uneven internal echo and poor mobility. (Figure 1) Ultrasound diagnosis was substantial right ventricular mass.

The patient was further examined by CEUS. Left ventricular opacification (LVO) showed substantial space occupation, 32mm×35mm in size, attached to the free wall of the right ventricle, with uneven internal echo, clear edge, and low activity. Myocardial contrast echocardiography (MCE) revealed the following: perfusion of contrast agents inside the mass was not uniform, and most showed a relatively high concentration of contrast agents. (Figure 2) According to the results of CEUS, the patient was considered to have abundant vascular supply in the right ventricular substantial space.

The patient underwent extracorporeal circulation of cardiac tumor resection with general anesthesia and pulling the tricuspid revealed the right ventricular mass. The mass was located between the anterior and posterior papillary muscles, approximately 3cm in diameter and soft and with myocardial synechia. The root of the mass was wide and originated from the posterior papillary muscle, approximately 1cm in diameter. Intraoperatively, the mass was completely removed from the papillary muscle. The wound surface at the papillary muscle was destroyed by electroablation, the posterior papillary muscle was completely preserved, and other parts of the tumor that adhered to the myocardium were removed. The specimen was resected and sent to pathology. The pathological diagnosis was cavernous hemangioma. (Figure 3)

Postoperatively, the patient received symptomatic support treatment, such as infection prevention, acid suppression, phlegm reduction, and myocardial nutrition. The patient was followed up for one year, and no recurrence of the hemangioma was found by transthoracic echocardiography.

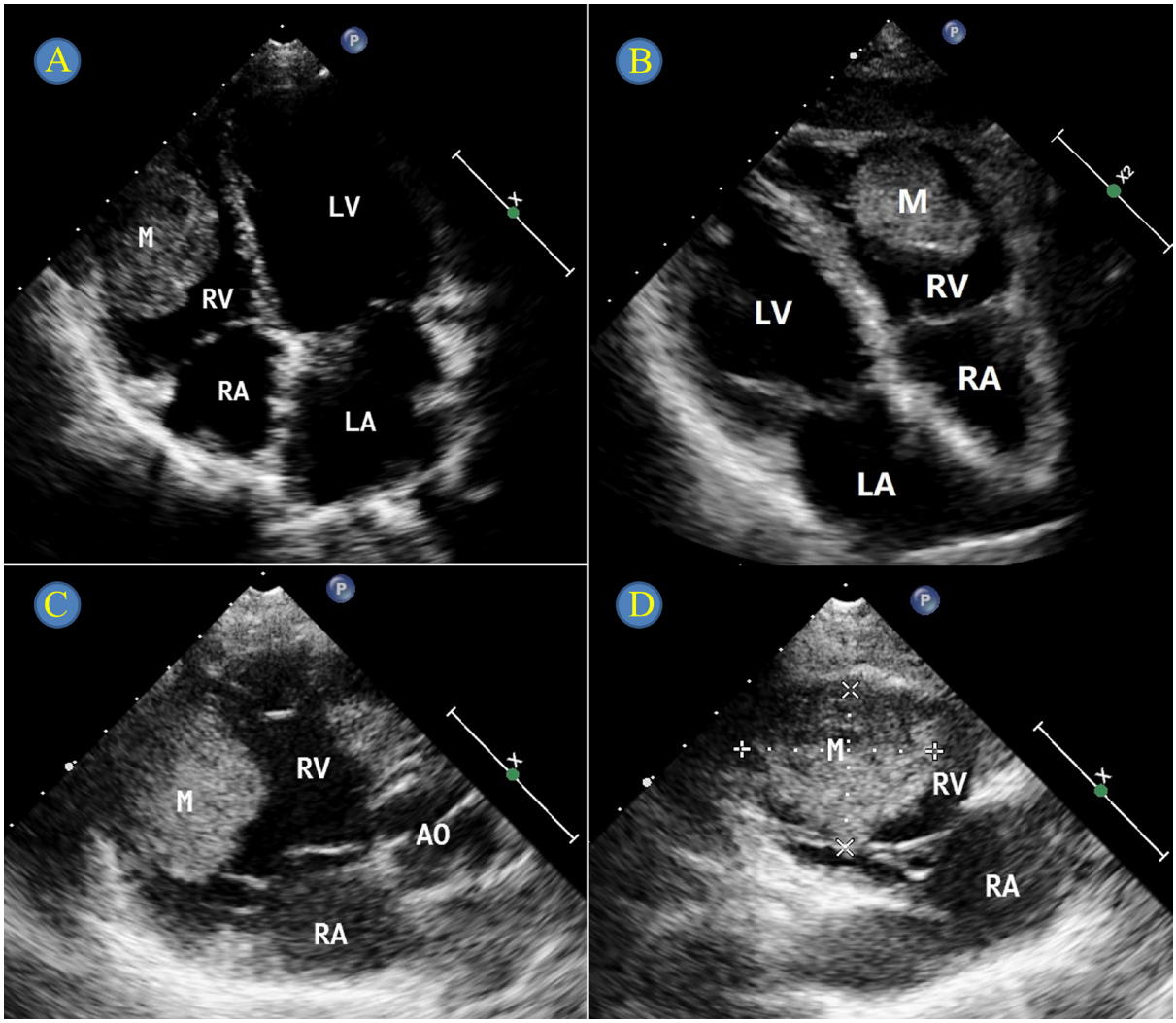

Figure 1. Two-dimensional echocardiographic images. A) Apical four-chamber view; B) Subcostal four-chamber view; C) Parasternal left ventricular short-axis view of the aortic valve level; D) Long-axis view of the parasternal right ventricular inflow tract. RA, right atrium; RV, right ventricle; LA, left atrium; LV, left ventricle; AO, aorta; M, right ventricular mass.

DISCUSSION

Cardiac tumors can be divided into primary and secondary tumors. Cavernous hemangioma of the heart is an extremely rare primary benign heart tumor that most commonly develops in adults and mostly is located not only in the heart cavity but also in the pericardium, myocardium, and heart valves [Floria 2011]. Generally, there are no specific clinical manifestations, but some patients show arrhythmia and cardiac insufficiency. In this case, cavernous hemangioma of the heart is located in the right ventricle, and the tumor volume is large. Further development may affect the hemodynamics of the right ventricle. Therefore, surgical resection is required to reduce the risk of hemangioma rupture or pulmonary embolism.

This case should be distinguished from myxoma, rhabdomyoma, lipoma, and cardiac malignant tumor. Echocardiography of myxoma showed a strong echogenic mass, which usually has a pedicle near the foramen ovale in the atrial septum, with high activity [Hasnie 2021]. Rhabdomyoma is most common in childhood. Sonography showed strong echogenicity in the muscular ventricular wall and homogeneous echogenicity in the interior wall [Okada 2021]. Echography showed that lipoma is more uniform, generally lobulated, and more often under the epicardium but also located in the heart lumen [Huang 2020]. The ultrasound characteristics of cardiac malignant tumor are an irregular shape, uneven internal echo, invasive growth, fuzzy boundary, and unclear boundary with surrounding tissues [Tadic 2020]. Although the blood supply of this case is abundant, the morphology is regular and the boundary is clear, so it can be identified.

Transthoracic echocardiography has the advantages of economy, convenience, and absence of radiation and is the

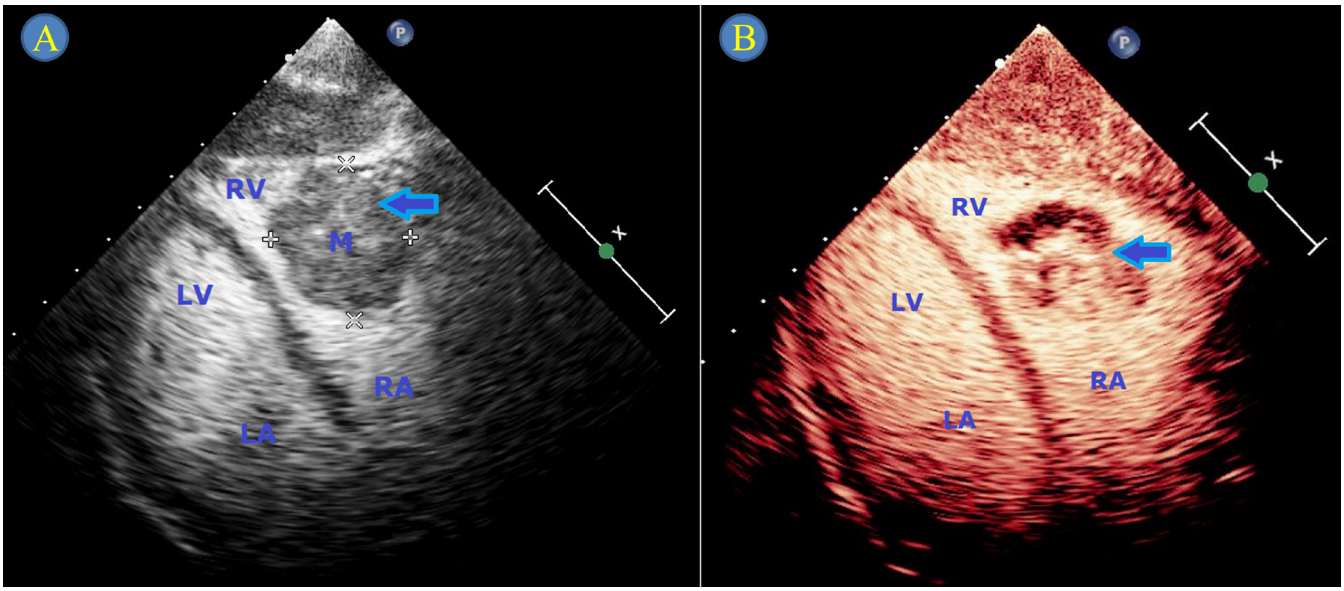

Figure 2. Contrast-enhanced ultrasound images. A) Image of left ventricular opacification (LVO); B) Image of myocardial contrast echocardiography (MCE). RA, right atrium; RV, right ventricle; LA, left atrium; LV, left ventricle; M, right ventricular mass (blue arrow represents the right ventricular solid lesion)

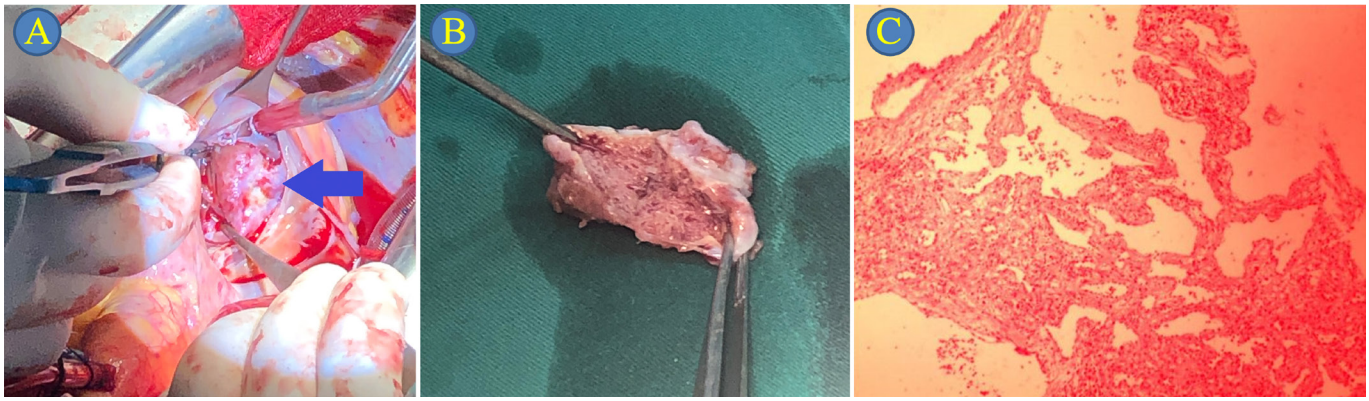

Figure 3. Thoracotomy surgery and histopathological images. A) Traction of the tricuspid valve reveals the right ventricular mass (The blue arrow represents the right ventricular solid lesion); B) Surgically removed mass; C) Histopathological image (HE staining; magnification, 200×)

first choice for the examination of cardiac space-occupying lesions. The volume of cavernous hemangioma, in this case, was large, and CEUS revealed that the edge was clear, and the internal blood supply was abundant, which proved that CEUS is of great significance in the diagnosis of cavernous hemangioma.

CONCLUSION

The case suggested that, when a cardiac space-occupying lesion was detected by ultrasound, in addition to two-dimensional ultrasound, CEUS could display more clearly the morphological boundary of the occupation and blood supply inside the occupation, providing important guidance for the selection of surgical methods.

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