



## Clinical Case Report

## Coronary and atrial compression by a giant cardiac hemangioma



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## ABSTRACT

A 57-year-old asymptomatic man showed a round echo-dense mass, partially occupying the left atrium on echocardiography. Magnetic resonance localized the mass in the atrioventricular groove, inside the pericardial space, and showed a large hepatic mass too. Computed tomography revealed significant compression of the left main coronary artery and of the left pulmonary veins outlet. The tumor was surgically removed and diagnosed as hemangioma. Heart hemangiomas are extremely rare; they are usually asymptomatic but sometimes they grow rapidly, causing various symptoms. In our case, life-threatening compression of the left main coronary artery and of the pulmonary veins warranted the intervention.

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## 1. Case description

A 57-year-old asymptomatic man underwent routine transthoracic echocardiography because of arterial hypertension and familial history of enlarged thoracic aorta. A round echo-dense mass was observed (Fig. 1A and Video 1), partially occupying the left atrium (LA), close to the posterior leaflet of the mitral valve.

Cardiac magnetic resonance (CMR; 1.5-T Philips Achieva scanner) localized the large, capsulated, ovoid mass (5×5×7 cm) in the atrioventricular groove, inside the pericardial space. The mass was markedly compressing the cranial aspect of the LA and slightly compressing the left pulmonary artery (Video 2); it appeared to be nonlipid (isointense on T1-weighted images and hyperintense in fat-suppressed T1-weighted images), rich in water (hyperintense in T2-weighted images; Fig. 1B) and partially vascularized (unevenly hyperintense after gadolinium; Video 2). Also, CMR scout images showed the presence of a large (85 mm maximum diameter) hepatic

*Abbreviations:* AO, aorta; LV, left ventricle; RV, right ventricle; LM, left main coronary artery; PA, pulmonary artery; LPV, left pulmonary veins outlet; CMR, cardiac magnetic resonance; CT, computed tomography; LA, left atrium.

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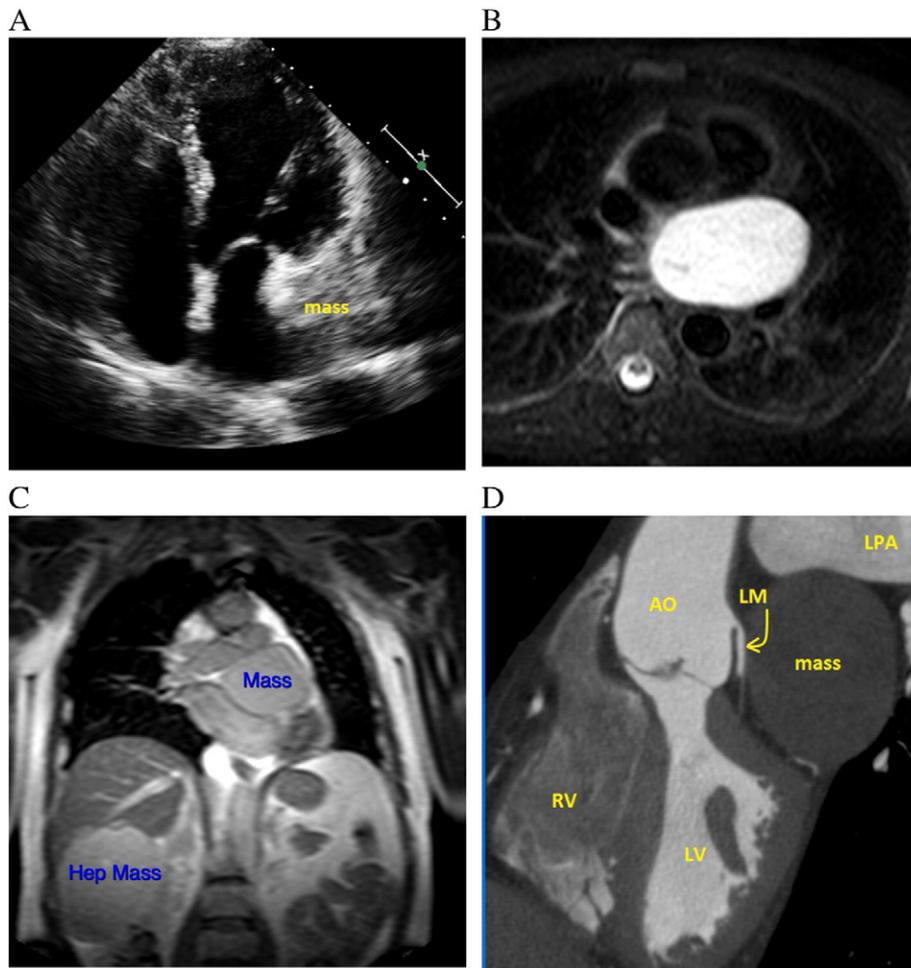
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mass (Fig. 1C), previously defined as a benign hepatic hemangioma by contrast computed tomography (CT).

A 64-slice electrocardiogram-gated cardiac CT scan (GE Lightspeed VCT 64 scanner) was then planned to further evaluate the spatial relationship between the mass and the structures of the atrioventricular groove, particularly the circumflex coronary artery. CT scan confirmed massive LA compression, with nearly complete blocking of the left pulmonary veins outlet. Furthermore, significant compression on the left main and on the proximal portion of the circumflex artery was evident (Fig. 1D). Due to slow contrast enhancement of the mass, volume rendering reconstruction with custom color look-up table (OsiriX v.5.6 64-bit, Pixmeo SARL, Bernex, CH) allowed a “virtual” removal of the mass, further clarifying the anatomical relations of the mass (Fig. 2A and Video 3). The coronary tree was free from obstructive atherosclerotic plaques.

The patient underwent surgery via median sternotomy. The tumor appeared as a solid, dark reddish, well-vascularized mass (Fig. 2B and C). It was entirely cleaved from the surrounding tissues on the beating heart with the help of cardiopulmonary bypass. Microscopic examination (Fig. 2D) revealed the presence of layers of thin endothelial (CD31-positive) cells delimiting blood-containing spaces, leading to the diagnosis of hemangioma. The postoperative course was uneventful, and the patient was discharged from the hospital 7 days after the operation. Postoperative 1-year follow-up with CMR has been planned.



**Fig. 1.** (A) Two-dimensional echo appearance of the mass. (B) T2-weighted axial image showing high T2 signal of the mass, indicating high water content. (C) Coronal scout magnetic resonance image, showing both hepatic (Hep Mass) and cardiac mass. (D) CT multiplanar reconstruction showing the mass compressing the left main coronary trunk.

## 2. Comments

Hemangiomas of the heart are extremely rare, accounting for only 2–3% of all benign primary cardiac tumors, and are usually asymptomatic [1,2]. Sometimes, as in this case, they can be found both in the heart and in the liver at the same time [3]. They have imaging features similar to cardiac myxomas (being usually well circumscribed, rich in water and poor in fat) although, differently from myxomas, they usually do not have a narrow stalk attached to the interatrial septum [4].

The growth rate of hemangiomas is unpredictable: they may proliferate, remain stable or regress; recently, 43% increase in tumor size over approximately 1 year was reported by two serial positron emission tomography scans [5]. A rapid growth may cause various symptoms due to compression of adjacent cardiac structures [1,2,6]: particularly, myocardial ischemia due to extrinsic coronary compression by a hemangioma has been rarely described [7].

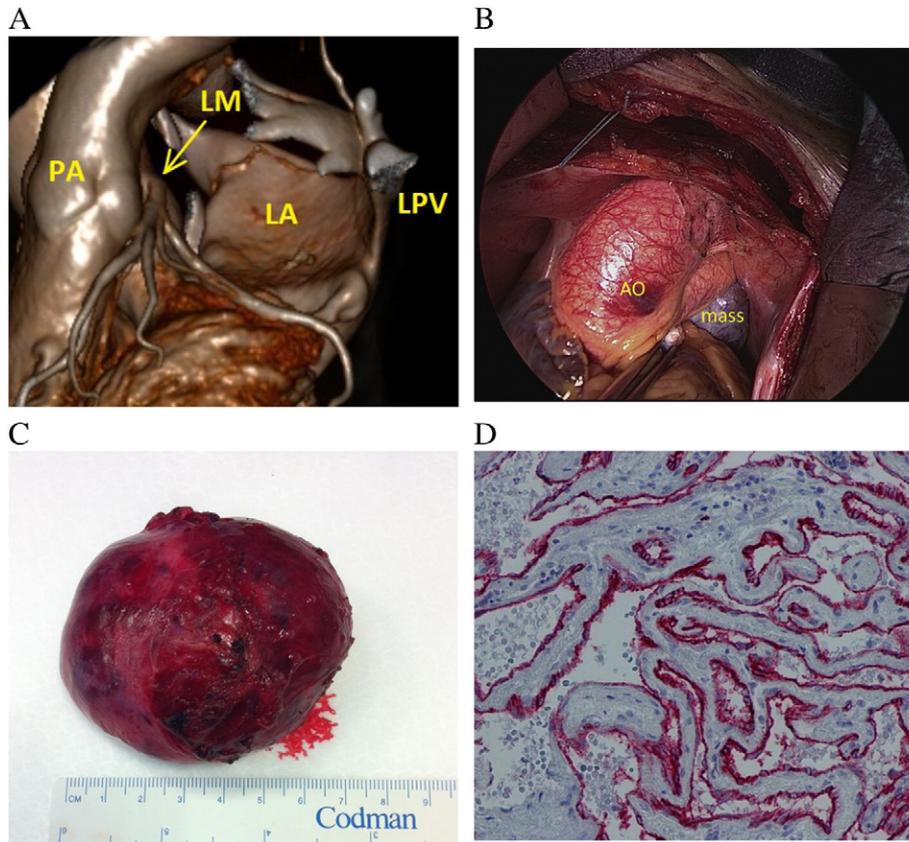
Cardiac CT and CMR are complementary techniques, both crucial to the accurate noninvasive diagnosis of cardiac masses [8]. In our case, though CMR led us to the diagnosis of a primary benign tumor, CT was decisive, by showing compression of the left main coronary artery. As

often happens with cardiac tumors, it was a malignant location of a benign lesion. Coronary and atrial compression, aside from the need for histopathological diagnosis, warranted the intervention.

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.carpath.2014.06.005>.

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**Fig. 2.** (A) Volume-rendered CT image of the heart, with “virtual removal” of the tumor by image postprocessing, allowed thorough preoperative evaluation of the mass anatomical relations. (B) Intraoperative view. (C) Macroscopic view of the tumor. (D) Immunohistochemical staining with the endothelial marker CD31: large blood-containing spaces lined by endothelial cells (CD31 positive).