

Giant pericardial mass case report: role of echocardiography

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Abstract: Cardiac masses are rare and they are distinguished in tumors and non-tumoral masses. Primary pericardial masses are very rare and they are often asymptomatic, even if they can present with sudden cardiac death. The diagnosis of these masses is often accidental and they are generally identified with echocardiography; their characterization is usually performed by cardiac magnetic resonance imaging (MRI) but the definitive diagnosis is achieved by tissue biopsy. We described a case of primary pericardial mass in an old patient with history of hypertension, which presented at our hospital with dyspnea and low-extremity edema. The echocardiography described a giant iso/hypoechoic pericardial mass that extended on anterior, posterior and lateral walls of left ventricle and atrium, associated with pericardial effusion without hemodynamic compromise. We discovered that the mass was identified twenty years ago on a chest-computed tomography (CT). Even if we do not manage in performing a cardiac MRI, from echo characteristics we supposed that the mass was a lipoma. Lipomas are benign tumors that can develop from pericardium and they have slow growth so they can be asymptomatic for several years. Their excision is important because they may be responsible for pericardial tamponade or heart failure. Echocardiography is an economic non-invasive exam and it is helpful in differential diagnosis, treatment, follow-up and prognosis of this cardiac masses.

Keywords: Pericardial mass; lipoma; echocardiography

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Introduction

Cardiac masses are uncommon and they can be classified as tumors or non-tumoral masses that include thrombus and cysts. Primary cardiac tumors are rare, with a prevalence of approximately 0.02–0.056% (1,2). Tumors are distinguished in benign tumors, tumors of uncertain biologic behavior, germ cell tumors, and malignant (3). Primary pericardial neoplasms are very rare and they are detected incidentally during routine cardiac imaging in asymptomatic patients (4); their prevalence ranges from about 0.001% to 0.007% (5). Some cardiac masses can present with systemic symptoms or symptoms related to their localization.

Imaging plays a central role in the diagnosis of cardiac masses; chest X-ray is often the first step and it usually shows enlarged cardiac silhouette with abnormal

mediastinic contour (6). Echocardiography is always performed because it is a non-invasive and economic tool; it can reveal the cardiac mass and from its characteristics, it may indicate benign or malignant aspect and so it may help in the differential diagnosis, together with cardiac computed tomography (CT) scan and magnetic resonance imaging (MRI). We report the case of a patient with a giant pericardial mass. We present the following case in accordance with the CARE reporting checklist (available at <http://dx.doi.org/10.21037/acr-20-141>).

Case presentation

An 82-year-old man was admitted to the hospital for great dyspnea and lower-extremity edema, started some days previously. He was a former smoker and he had

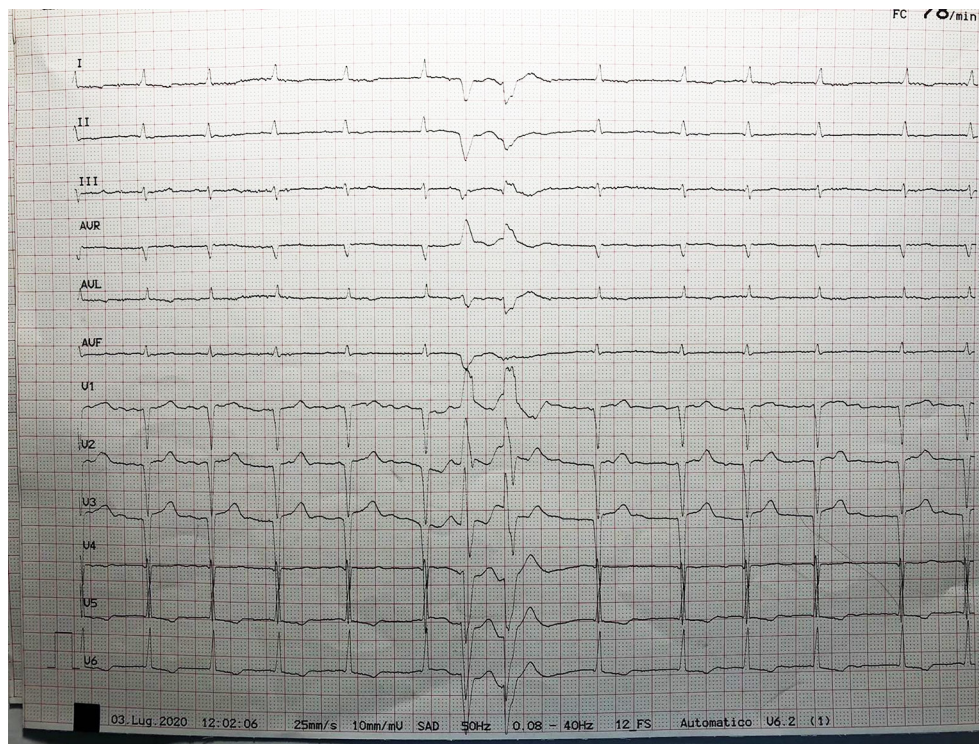


Figure 1 ECG. Patient had atrial fibrillation at medium ventricular rate response and two ectopic ventricular beats.

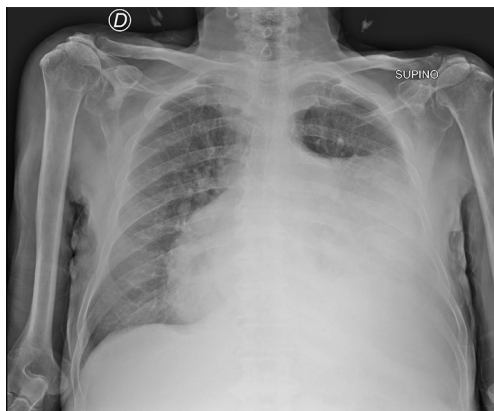


Figure 2 Chest X-ray revealed great increase in heart silhouette and pleural effusion.

history of hypertension and high uric acid level. He took antihypertensive drugs.

On hospital admission his blood pressure was 100/60 mmHg, heart rate 80 beats per minute, 22 breaths per minute and temperature 36 °C. Electrocardiogram performed in the Emergency Department showed atrial

fibrillation at medium rate and two ectopic ventricular beats (*Figure 1*); blood tests showed low levels of cardiac enzymes (high-sensitivity troponin T 25 ng/L, myoglobin 50 ng/mL, creatin kinase-MB 0.8 ng/mL), and high levels of NT-pro-BNP (3,000 ng/mL); patient's serum creatinine level was 1.31 mg/dL corresponding to calculated eGFR 34 mL/min, azotaemia levels were 110 mg/dL, hemoglobin 14 g/dL, platelet count 200,000/mm³, protein C reactive 10.6 mg/dL, acid uric level 14.9 mg/dL. Patient executed chest X-ray that indicated a great increase in heart silhouette and pleural effusion (*Figure 2*).

Chest-CT with contrast agent demonstrated mild increased interstitial markings and a large, low-attenuation intrapericardial lesion with no enhancing components (*Figure 3*). It also revealed pleural and pericardial effusion.

The echocardiography performed on the admission day showed a great pericardial mass measuring 4 cm × 10 cm that appeared to arise from the left atrioventricular groove and was adjacent to the anterior, posterior and lateral walls of the left ventricle and to the left atrium (*Video 1*). It did not invade into the epicardial fat or myocardium; it was iso/hypoechoic, well circumscribed, non-contractile, homogeneous and with a clear separation from the wall,

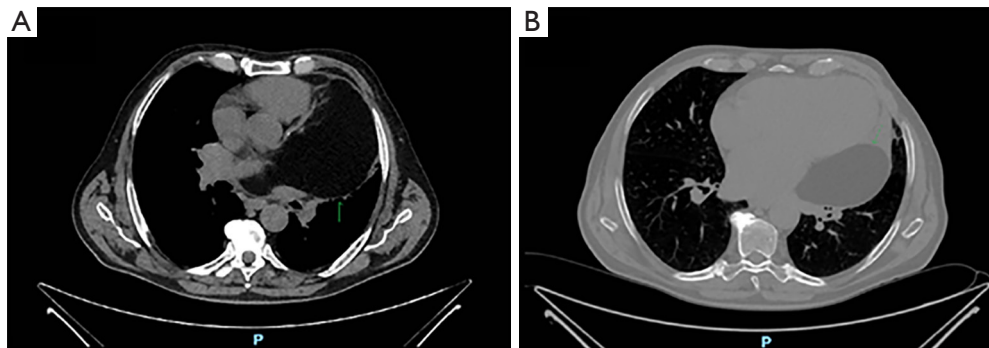


Figure 3 Chest-CT with contrast agent. (A) Large, low-attenuation intrapericardial lesion with no enhancing components; (B) mild increased interstitial markings.

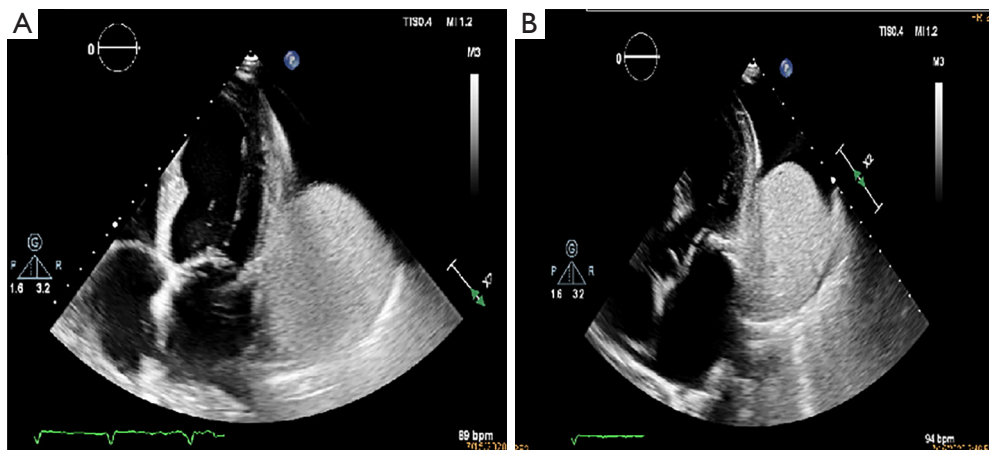


Figure 4 Echocardiography. (A) Great pericardial mass was adjacent to the anterior, posterior and lateral walls of the left ventricle and to the left atrium. (B) The mass appeared to arise from the left atrioventricular groove.

probably encapsulated (*Figure 4*).

There was even a great pericardial effusion but there were no signs of cardiac tamponade (*Figure 5*). Transthoracic echocardiogram showed dilated left ventricle with global hypokinesia and a severe reduced ejection fraction of 28%; main pulmonary artery was dilated and there were severe functional mitral regurgitation and moderate tricuspid regurgitation (*Figure 6*). During the hospitalization a coronary angiography was performed, detecting no coronary arteries stenosis.

Administration of intravenous diuretics was started and Cardiac-MRI was purposed, but in one week patient's clinical condition improved and he was discharged from the hospital. He refused additional exams.

All procedures performed in studies involving human participants were in accordance with the ethical standards of

the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient.

Discussion

The most common benign pericardial tumor is lipoma but the most common pericardial mass is a cyst. Mesothelioma is the most common primary malignant pericardial tumor (7).

Patients with primary pericardial neoplasms can present with symptoms that include exertional dyspnea, chest pain, cough, palpitations, fatigue, night sweats, fever, and facial or lower-extremity edema (5).

The echocardiography can identify the mass, its localization, extension, size and even tissue characteristics. Echocardiography has a narrower field of view than MRI

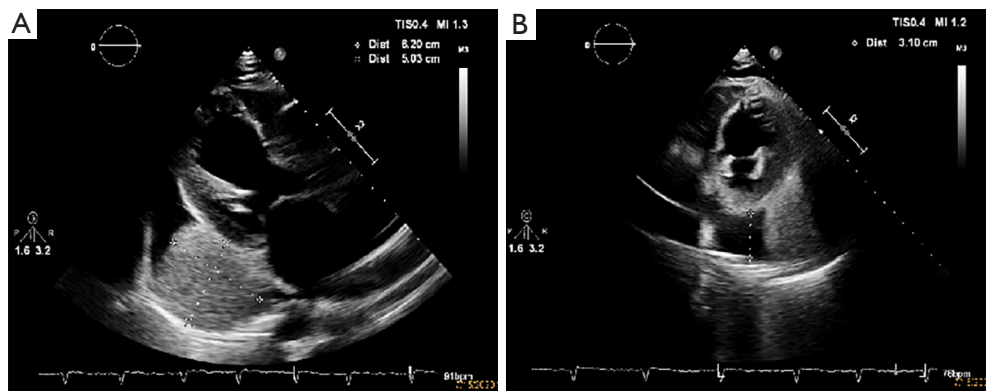


Figure 5 Echocardiography. (A) In the parasternal long-axis the mass measured 6 cm × 5 cm. (B) There was a great pericardial effusion.

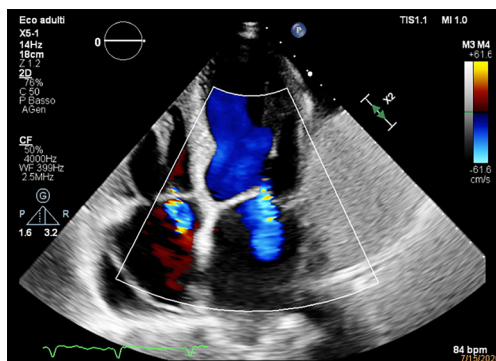


Figure 6 The echocardiography showed sever mitral regurgitation and moderate tricuspid regurgitation.

or CT in general (4), but it plays a central role in the first approach to the patient with cardiac symptoms because it can be performed in the Emergency Department, it is an economic, simple, non-invasive test. It may aid to diagnosis, prognosis, treatment and patient follow-up of cardiac masses. In this case, echo characteristics suggested that the mass was a lipoma that is composed by adipose tissue.

Lipomas are primary benign cardiac tumors that frequently develop from the subendocardium, but they may also grow from the pericardium or on the cardiac valves (4).

On echo lipoma tends to be homogenous without evidence of calcification, hyperechoic in the cavity and hypoechoic in the pericardium. It usually is broad based, immobile, without a pedicle and well circumscribed, sometimes with a capsule (4); pericardial lipoma tends to be less capsulated (5).

Small lipomas are often asymptomatic and found incidentally, whereas great or pericardial lipomas may manifest with symptoms such as compression of coronary arteries, arrhythmias, and outflow obstruction (8,9). They can become giant without producing any symptoms because their growth is slow. A case of giant pericardial lipoma that induced cardiac tamponade was described on August 2019 (10). We reported a case of giant pericardial lipoma that probably produced pericardial effusion but this may have been induced also by the heart failure. Thereby heart failure may derive by mass compression of cardiac chambers. We can also assume it because the coronary angiography performed during the hospitalization did not show any atherosclerotic plaque. Moreover, mitral regurgitation stems from the severe left ventricle dilation and the consequential leaflet tethering.

Thanks to a detailed anamnesis, we found that pericardial mass was identified twenty years ago on a chest-CT. Because of mass favorable echocardiographic characteristics, size and time of the development, we purposed that it was a lipoma.

Surgical resection is necessary to prevent tumor compression syndromes of the heart and even to exclude a malignant process by histological examination of excised specimens (11). In fact, even if it is very rare, great mass may evolve in liposarcoma.

In this case we remarked the central role of echocardiography as technique of choice to first approach in patient with cardiac mass and we recommended the choice of surgical resection even if the tumor is benign and asymptomatic.

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Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at <http://dx.doi.org/10.21037/acr-20-141>

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/acr-20-141>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient.

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