Case Report

Right Heart Failure Caused by Pericardial Mass: Case Report

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Case presentation

A 40-year-old male patient sought emergency care due to intensification of chronic epigastric pain on moderate exertion, without irradiation, and unrelated to food.

On physical examination, vitals, blood pressure 129/81 mmHg, pulse rate 88 beats per minute, respiratory rate 20 breaths per minute, oxygen saturation 98%. He presented significant bilateral jugular distension (Figure 1), irregular heart rhythm, and midsystolic click at the low left sternal border, pulmonary auscultation had vesicular murmurs present bilaterally without other adventitious sounds, flaccid abdomen, painful on palpation of the epigastrium and right hypochondrium, without hepatic augmentation and symmetrical edema in lower limbs ++/4. Initial evaluation demonstrated those signs were of right heart failure.

Past medical history

The patient had a history of dilated cardiomyopathy with a left ventricle ejection fraction (LVEF) of 20%, diagnosed 4 years ago, and permanent atrial fibrillation. The patient was on enalapril, carvedilol, spironolactone, furosemide, warfarin, and omeprazole, but despite knowledge of the disease, he was on irregular use of those medications and without medical follow-up. A recent investigation for abdominal pain and treatment carried out with a gastroenterologist showed no relief.

Differential diagnosis

The potential causes of right heart failure in this patient might include cardiac tamponade, pericarditis, including constrictive and tuberculosis, cardiac tumors, tricuspid valve disease, left heart failure, and even vena cava syndrome.

Investigations

Upon admission, after investigation for atypical chest pain (epigastric pain), coronary origin was ruled out and it was related to liver congestion. High sensitivity troponins were within normal range, BNP was 188 pg/ml (reference value < 100 pg/mL), and GT range of 206 UI/L (reference value < 64UI/L). CT angiography computerized of the chest (Figure 2) demonstrated mediastinal lymph node enlargement, mild pericardial calcification, increased caliber in bilateral vena cava with filling failure in the lower vena cava, increased cardiac volume, in addition to a 66 x 40mm mass in the anteroinferior cardiac portion and another mass at the top of the anterior aspect, adjacent to the 40 x 30mm base vessels. An abdominal tomography was performed with an enlarged liver, blunt and regular contours, preserved density, and homogeneous contrast medium uptake, suggesting hepatic congestion. Therefore, with findings associated with systemic venous congestion.

Bedside transthoracic echocardiography revealed atypical movement of the interatrial septum, marked biatrial enlargement, mild left pleural effusion, and discreet pericardial effusion. One week later, a new transthoracic echocardiogram showed an ejection fraction of 35%, left atrium enlargement to 56mm (reference range 19-40mm), thickened pericardium associated with hypoechoic imaging, characterized by regular edges and thickened walls adjacent to the right ventricle (with a hypothesis of cyst), right ventricle with systolic dysfunction due to restricted mobility of the free wall, left ventricle with moderate systolic dysfunction, and mild mitral and tricuspid regurgitation.

To define the thoracic mass, and distinguish between cardiac and pericardial mass, magnetic resonance imaging of the heart was performed (Figure 3), which showed an LVEF of 35%, a right ventricle with signs of significant diastolic restriction associated with extrinsic compression of the free wall related to the pericardial mass, also demonstrating diffuse hypokinesia and mild systolic dysfunction, which showed an EF of 41%. Enlargement of the left chambers and right atrium. Significant pericardial thickening restricted to the region of the right atrioventricular groove, compressing the right ventricle with mass effect, without signs of flow within it and with signs of restriction suggestive of constrictive pericarditis.

After analysis of the images, constrictive pericarditis became the primary diagnostic hypothesis, and the presence of a thrombus within the pericardial mass was considered. This consideration was based on the significant enlargement of the patient's atrium, the previous history of atrial fibrillation, and a reduced ejection fraction, which together could have led to thrombus formation.

Keywords

Heart Failure; Pericardium; Constrictive Pericarditis.

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Figure 1 – *Bilateral jugular distension. Panel A: Right side. Panel B: Left side.*

Management

The patient was treated with diuretics and reintroduction of medications for heart failure due to its left side's known previous dysfunction, in addition to anticoagulation for atrial fibrillation and heart rate control.

The patient was referred for cardiac surgery. Pericardiectomy was performed for definitive diagnosis and treatment of right heart failure caused by the mass. At the time, adhesions related to constrictive pericarditis were removed. Postoperatively, he developed pneumonia but progressed well and was discharged two weeks after surgery. The anatomopathological examination of the pericardium demonstrated fibrous thickening, with a chronic non-granulomatous inflammatory process, with areas of dystrophic calcification, associated with signs of old and recent hemorrhage, with adhered fibrin and absence of malignancy, these results corroborated with constrictive pericarditis.

Discussion

Pericardial masses are uncommon and classified as tumors or not. Among non-tumorous masses, thrombi and cysts are rare.[1] Constrictive pericarditis results from fibrous thickening of the pericardium due to chronic inflammation of various lesions and is a rare cause of heart failure (HF).[2,3] Idiopathic and post-infectious pericarditis are the most common causes.[4,5] The clinical signs and symptoms of HF are presented according to the affected cardiac chamber, which are: low cardiac output, systemic congestion, jugular distension, edema, ascites, visceromegaly, orthopnea, and paroxysmal nocturnal dyspnea.[1,6] The symptoms of right heart failure may predominate due to pressure equalization. Diagnosis cannot be limited to clinical findings and complementary exams play a fundamental role. The treatment of choice is pericardiectomy (Figure 4).[6-9]

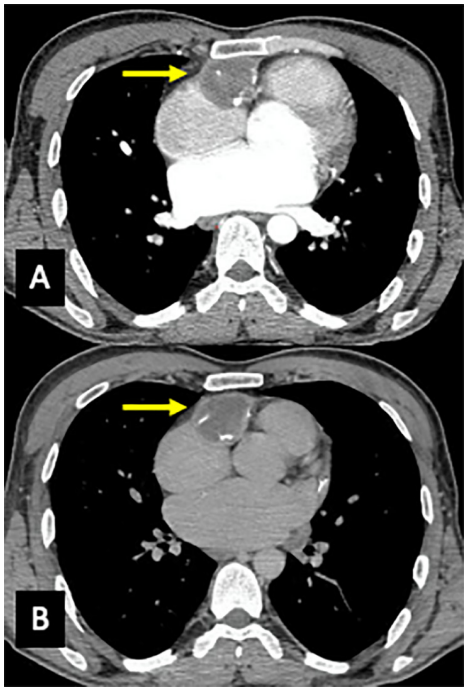

Figure 2 – *Chest computed tomography. Panels with (A) and without (B) contrast showing collection (yellow arrows) adjacent to the heart's right chambers associated with mild pericardial and mass calcification.*

Follow-Up

At the time of this publication, the patient is asymptomatic and without recurrences of events, using enalapril, metoprolol, furosemide, spironolactone, digoxin, dapagliflozin and rivaroxaban, undergoing regular outpatient follow-up at the cardiology service.

Conclusions

Although rare, pericardial changes can cause cardiac restriction and have right heart failure as the predominant manifestation. In this case, the formation of a well-localized mass, in an atypical presentation of constrictive pericarditis, compressed the entire right ventricle and was the manifestation that culminated in the diagnosis, with excision being indicated to correct the acute heart failure.

Author Contributions

Conception and design of the research; Acquisition of data; Analysis and interpretation of the data; Statistical analysis; Writing of the manuscript and Critical revision of the manuscript for content: Padilha I, Rocha BCA, Faria GC, Kusdra KK, Marció A, Andreatta MA, Magalhães Pinto GM, Albino EC, Joaquim RM.

Potential conflict of interest

No potential conflict of interest relevant to this article was reported.

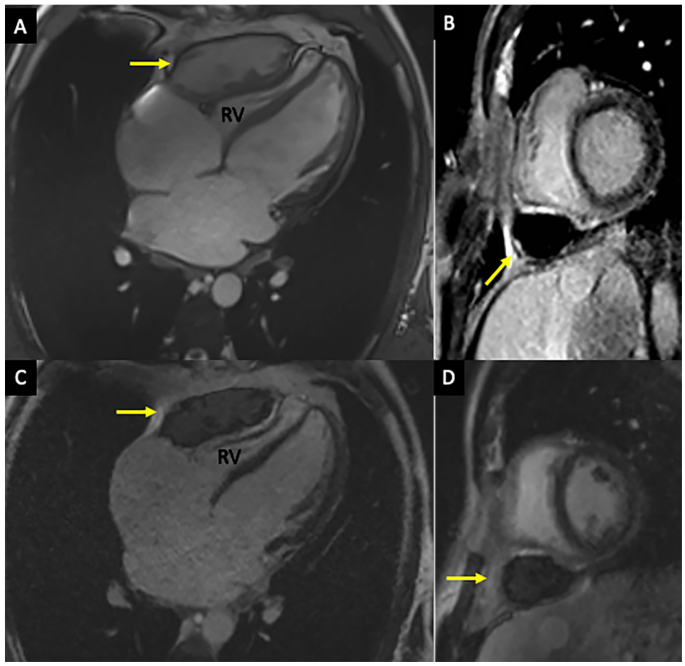

Figure 3 – *Magnetic resonance of the heart. Panels A through D show pericardial thickening, with mass formation and collection compressing the RV (Yellow Arrows). Panels C and D suggest the presence of a thrombus inside the collection with heterogeneous density in the imaging. RV: right ventricle.*

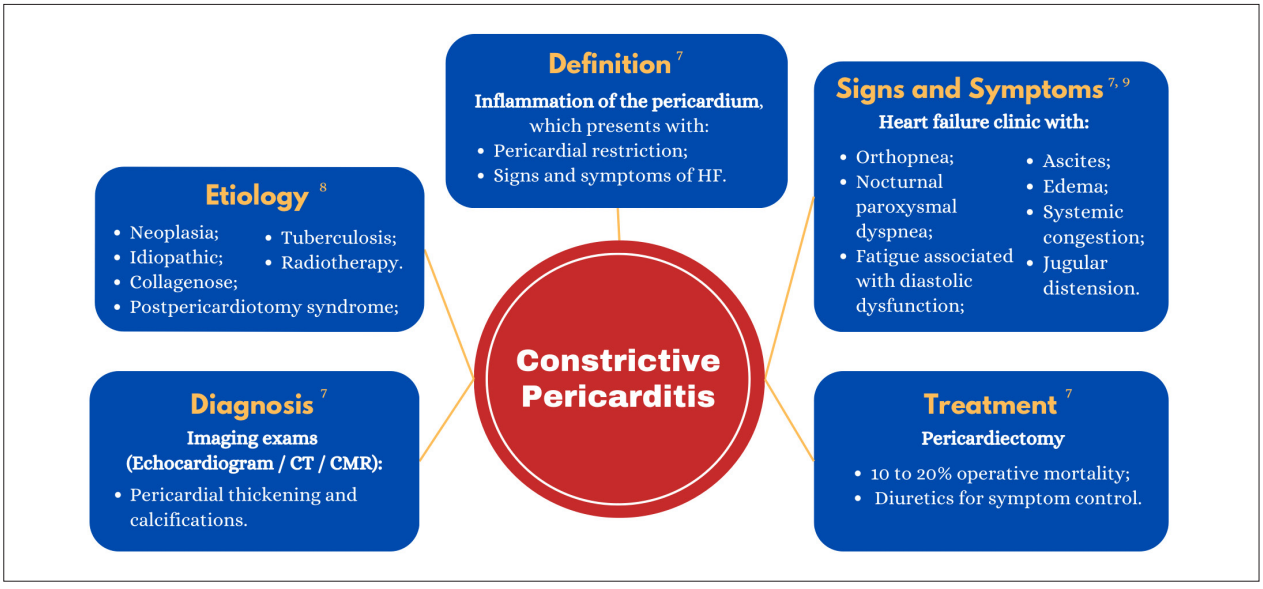

Figure 4 – *Features of constrictive pericarditis. HF: heart failure; CT: computed tomography; CMR: cardiac magnetic resonance.*

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There were no external funding sources for this study.

Study association

This study is not associated with any thesis or dissertation work.

Ethics approval and consent to participate

This study was approved by the Ethics Committee of the Instituto de Cardiologia de Santa Catarina under the protocol number CAAE 81899624.9.0000.0113 . All the procedures in this study were in accordance with the 1975 Helsinki Declaration, updated in 2013. Informed consent was obtained from all participants included in the study.

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