

Acute Heart Failure and a Pseudo Cystic Image in the Left Ventricle

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ABSTRACT

The association between acute heart failure (AHF) and cardiac tumor may change the short and long term management of both conditions. A 51-year-old man presented with signs of AHF. ECG showed sinus tachycardia and left ventricular (LV) hypertrophy. Chest x-Ray found dilated heart and pulmonary congestion. There were no significant changes in blood tests. Transthoracic echocardiography revealed chambers dilation, and LV ejection fraction (LVEF) of 17%. Unexpectedly, we found an apical 2/2 cm cystic image in the LV. This had a myocardium-like membrane, seen better in 3D echocardiography, suggestive for hydatid cyst. Cerebral, thoracic, and abdomino-pelvic CT scan showed no hydatid lesions. Anti-Echinococcus antibodies were negative. Initially the clinical challenge was the management of the tumor in a patient with AHF and dilated cardiomyopathy. He was treated for AHF and followed up for the cystic image. He exhibited significant improvement of the clinical status and LVEF (increased to 42 %), with important cardiac reverse remodeling. Surprisingly, the apical cystic image disappeared. However, we found a hypertrophic aberrant cordae from apex to mid-septum, in the same position as the previous image. Thus, we believe that this cordae, by important remodeling and torsion generated the cystic image. This case highlights the importance of serial 2D and 3D echo examinations in patients with severely remodeled LV, and also with tumoral images.

Keywords: acute heart failure, cystic tumor, echocardiography

INTRODUCTION

Acute heart failure (AHF) is an important cause of mortality. Registries indicate that the combined outcome of death or rehospitalizations within 60 days of admission vary from 30 to 50% (1). Because heart tumors can mimic other heart diseases, they are difficult to diagnose accurately (2). Untreated cardiac tumors may be life threatening (2,3). The association between AHF and cardiac tumor may change the short and long term management of

both conditions. It is essential to know if the tumor is the cause of HF or not. Transthoracic echocardiography plays a key role in diagnosis and follows up of both conditions (4).

We report an interesting case of AHF associated with an apical left ventricular tumor-like image. Surprisingly, the cystic image disappeared after 1 month. However, we found a hypertrophic aberrant cordae in the same position as the previous image. It is important to consider this benign condition in order to institute proper therapy and a realistic plan for follow up. □

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CASE REPORT

A 51-year-old previously healthy alcoholic man was transferred from an infectious diseases unit to our emergency department. He presented posterior chest pain, hemoptysis, and severe rest dyspnea, developed during the last month and aggravated over the respective day. His recent medical history showed severe right lung pneumonia with right pleural effusion treated with broad-spectrum antibiotics therapy, two weeks before. Dyspnea persisted despite of the pneumonia resolution.

On admission, he was restless, with central cyanosis. He had mild hypotension (80/60 mmHg), tachycardia (120 BPM), with signs of

hypoperfusion, left ventricular gallop, and jugular turgor. He had also signs of pulmonary congestion, and small right pleural effusion. Abdominal examination revealed hepatomegaly. ECG showed sinus tachycardia, right bundle branch block, left ventricular (LV) hypertrophy, and non specific ST-T changes, probably due to LV hypertrophy. Chest x-Ray found dilated heart, pulmonary congestion, and right pleural effusion. There were small changes in blood tests suggestive for hepatic insufficiency and moderate inflammatory syndrome.

He was admitted to the cardiac intensive care unit where intravenous therapy with loop diuretic, digoxin, and oxygen by nasal canula was initiated. Transthoracic echocardiography

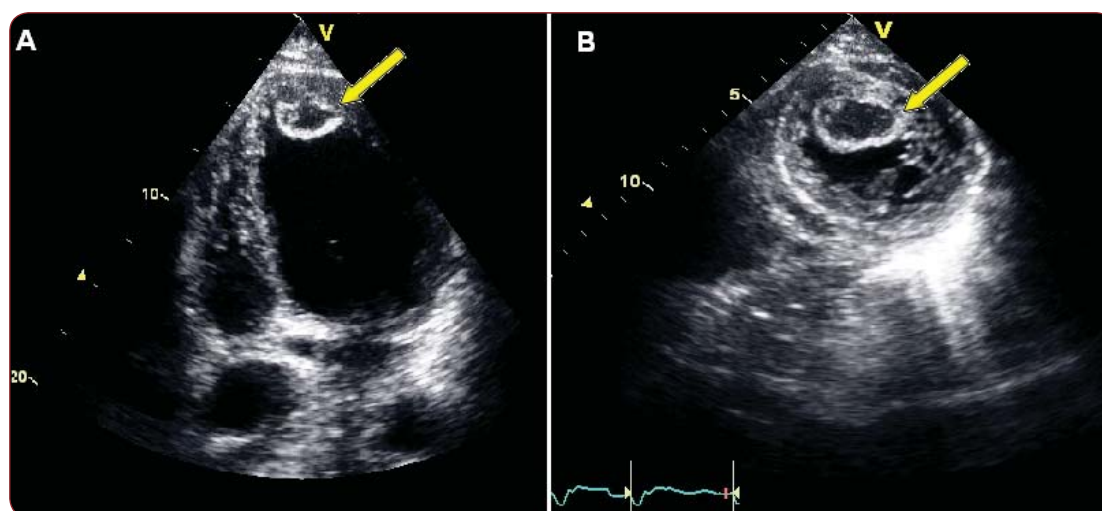


FIGURE 1. A. 4 chambers view from an apical transducer position showed a dilated, remodeled LV, and an apical cystic image, with a myocardium-like hyperechogenic membrane (yellow arrow); B. Apical short axis view from a parasternal transducer position showed the same cystic image (yellow arrow).

Parameters	Admission	1 month	6 months	12 months	Normal range
LVEF (%)	17	25	38	42	59±6
IVS (mm)	9	9	9	9	6-12
PW (mm)	9	9	9	9	6-12
LVEDD (mm)	71	68	64	58	35-60
LVESD (mm)	64	59	58	49	21-40
LVEDV (ml)	282	233	225	203	96-157
LVESV (ml)	233	175	142	127	33-68
RVED (mm)	52	49	35	30	22-44
MA (mm)	45	39	36	33	19-31
MR (grade)	3	2	1	1	0-1
PAPs (mmHg)	65	45	32	30	≤35
TR (grade)	2	1	1	1	0-1
E/E'	20	15	12	9	<8
E/A	2	1.6	0.7	0.6	0.7-1.9
TdE (msec)	83	70	336	280	140-220

TABLE 1. Transthoracic echocardiography during admission and follow up.

LVEF, left ventricular ejection fraction; IVS, interventricular septum; PW, posterior wall; LVEDD, left ventricular end diastolic diameter; LVESD, left ventricular end systolic diameter; LVEDV, left ventricular end diastolic volume; LVESV, left ventricular end systolic volume; RVEDD, right ventricular end diastolic diameter; MA, mitral annulus; MR, mitral regurgitation; TR tricuspid regurgitation; PAPs, systolic pulmonary artery pressure.

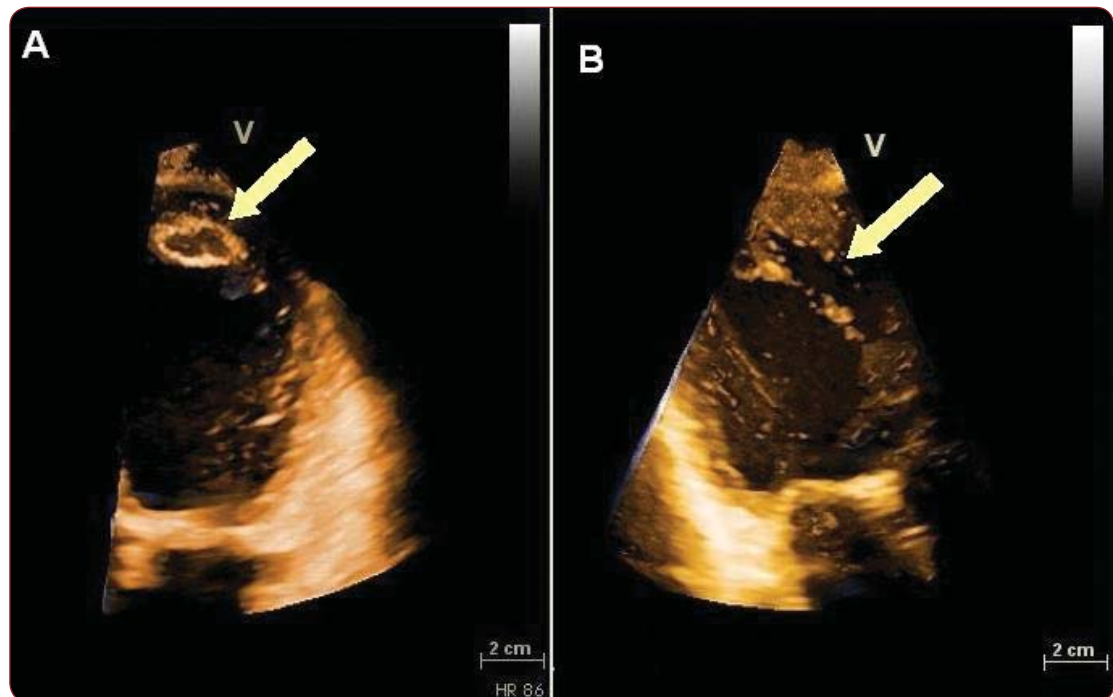


FIGURE 2. A. 4 chambers view from an apical transducer position in 3D echocardiography showed the apical cystic image, with very well define, myocardium-like membrane (yellow arrow); B. Modified 3 chambers view from an apical transducer position in 3D echocardiography after 1 month, showing a hypertrophic aberrant cordae in the apex of the LV (yellow arrow).

revealed important left and right chambers dilation, and LV ejection fraction (LVEF) of 17%, low cardiac output, moderate-to-severe mitral regurgitation (Table 1). Unexpectedly, we found an apical 2/2 cm cystic image in the LV, without colour Doppler signal inside (Figure 1A, B, and 2A).

Initially we suspected that tumoral image was suggestive for hydatid cyst. Cerebral, thoracic, and abdomino-pelvic CT scan showed no cystic lesions at all. Anti-Echinococcus antibodies (Immunoglobulin G) were negative. The patient was not hemodynamically stable enough to perform an MRI study.

He was treated with ACE-inhibitors, diuretics, β blockers, digoxin, aspirin, and followed up for the cystic image, in order to have a proper therapeutic decision concerning apical tumor. Coronary angiography was normal. Patient was discharged without dyspnea after 7 days.

He was evaluated after 1, 6, and 12 months. He exhibited significant improvement of the clinical status and LVEF (increased to 42%), with important reverse cardiac remodeling (Table 1). Surprisingly, the apical cystic image disappeared 1 month after admission (Figure 3A). However, we found a persistent hypertrophic

aberrant cordae from apex to mid-septum, in the same position as the previous image (Figure 2B, Figure 3B). $\square$

DISCUSSIONS

We report an interesting case of AHF associated with a cystic image in the apex of the LV, suspected to be cardiac hydatidosis. Initially the clinical challenge was the management of the tumor in a patient with severe left ventricular dysfunction. We did not consider that the tumor was responsible for AHF, because it was non obstructive.

Cardiac cysts account for 0.5-2% of all hydatid cysts in humans, but they are usually associated with fatal complications (5,6). The surgical excision is generally recommended, because of its serious consequences (7-9). The combination of imaging and serology usually provides an effective diagnosis, although sensitivity is quite low. Echocardiography, CT, and MRI can show the cystic nature of the mass and its relation to the cardiac chambers (10,11).

In our case, echocardiography revealed the apical cystic image suggestive for cardiac hydatidosis, but the CT scans and serology did not confirm the diagnosis. We did not perform

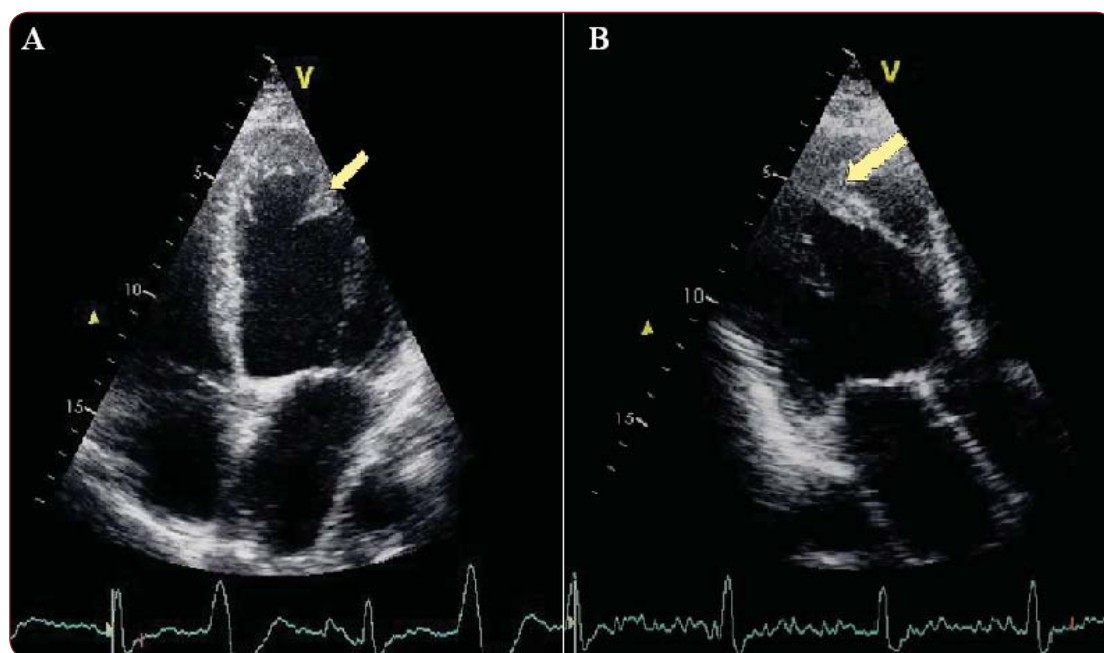


FIGURE 3. A. 4 chambers view from an apical transducer position after 1 month showed no cystic image in the LV. This image was replaced by an aberrant cordae, in the same position as the previous cystic image (yellow arrow).

B. 3 chambers view from an apical transducer position showed clearly a hypertrophic aberrant cordae, crossing the cavity of the LV from the midportion of the interventricular septum to the apex of the LV (yellow arrow).

transesophageal echocardiography because of a low sensibility in detection of the LV apical tumor. The LV apex may not be visualized in standard image planes because it is at considerable distance from the transducer, thereby limiting resolution of structural detail of this region, especially in dilated LV. Because the nature of the image was not clear at this stage, the initial strategy was to treat HF and to follow up the cystic image, in order to decide the best time for MRI and surgical treatment. The AHF could be generated by an acute decompensation of an unknown alcoholic dilated cardiomyopathy, due to pneumonia, or by an acute myocarditis added to a preexisting cardiomyopathy (LV hypertrophy favors this idea).

We also considered that the cystic image could be an atypical thrombus. LV thrombi are common complications of severe HF (12). Cystic-like thrombi are rarely seen on echo. They had been described, but their thrombotic etiology was proved indirectly, by their disappearance with anticoagulation therapy (12,13). However, our patient did not receive anticoagulation therapy, suggesting that the apical image disappeared spontaneously. This favored the non-thrombotic nature of the image.

The 2D and 3D echocardiography showed a cyst with a thick membrane, similar with the vicinity myocardium, with central lucency. This image could rather be suggestive for a blood cyst in the LV apex. Blood cysts of the heart are rare benign tumors, usually involving the cardiac valves (14,15). They had also been described on papillary muscles (16). They regress spontaneously by the age of 6 months and are rare in adults (14,17). They are often asymptomatic. The embolization and valvular dysfunctions had also been reported (17,18). It has been proposed that the blood cysts should be monitored with serial echo studies and removed routinely to exclude malignancy, and to avoid the potential risk of embolism (17).

In our patient the initial image could be a blood cyst on papillary muscles. However, it is hard to believe that this cyst could be disappeared only in 1 month, after 51 years of persistence.

After 1 month we found a hypertrophic aberrant cordae in the same position as the previous image. Discrete fibromuscular structures crossing the cavity of the LV were identified on morphological examination in 48% of the hearts of patients of all ages with congenital

heart disease, acquired heart disease, or normal hearts. Echocardiographic findings compatible with these structures were obtained in 21.7% of children and 0.4% of adults studied (19,20). LV cordae usually coursed from the midportion of the interventricular septum to the free wall of the LV. Most of them were detected in the apical four-chamber view. These structures appear to be a normal anatomical finding (21).

In our case we found a hypertrophic cordae probably because of long standing high pressure in the LV. Thus, we believe that this cordae, by important remodeling and torsion generated the initial image. The reverse-remodeling process could explain the disappearance of the cystic image.

Our case suffers from the lack of histological evidence. However, serial echocardiographic examinations revealed that the first image was in fact a pseudotumoral lesion. In this way, the initial strategy was completely changed. We did not perform MRI and ruled out surgery.

This case highlights the importance of serial 2D and 3D echo examinations in patients with severely remodeled LV, and also with tumoral images. □

CONCLUSIONS

Acute heart failure is an important cause of mortality. The association of a cardiac tumor could change the future management, particularly because tumor per se could generate congestive heart failure or heart failure could increase the surgical risk. Serial 2D and 3D echo examinations are very important in the treatment strategy of both conditions. It is important to also consider benign conditions such remodelled aberrant cordae that can mimic a tumor, in order to have a realistic plan for follow up.

Conflict of interests: none declared.

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