Hydatid cyst of the interventricular septum of the heart

A case report and literature review

Abstract

Hydatidosis is a frequent pathology which is still endemic in the kingdom of Morocco. Cardiac localization of hydatid cysts is rare representing 0.5 to 2% of all clinical forms of this condition. Hydatid cysts are usually observed in the left ventricle and involvement of the interventricular septum is exceptional. The principal diagnostic and preoperative investigations are serology and imaging by echocardiography and computed tomography, which can give conflicting results. The authors report a case of hydatid cyst of the interventricular septum in which echocardiography (the key investigation in all cases of hydatid cyst) computed tomography and nuclear magnetic resonance imaging were contributive to the diagnosis. The CT scan investigation also allowed diagnosis of pulmonary and cerebral involvement of the disease. Diagnostic or therapeutic delay can lead to severe and even fatal complications.

Introduction

Hydatidosis is a frequent pathology which is still endemic in the kingdom of Morocco [1]. Cardiac localization of hydatid cysts is rare (0.5% to 2%). The revealing symptomatology is nonspecific. The most frequent cardiac locations are the free wall of the left ventricle (LV) and the septum. The auricles can also be affected. Diagnostic or therapeutic delay can lead to severe and even fatal complications [2,3,4].

Only few series of cardiac hydatid disease and primary hydatid disease of the pericardium have been published in the literature. We report a case of hydatidosis of the interventricular septum revealed by an intracardiac mass.

Case Report

We report the case of a 32-year-old young man of rural origin admitted for exploration of NYHA stage II dyspnea accompanied by palpitation and atypical chest pain, occurring especially on low intensity effort.

The patient has a history of epilepsy since the young age of 10 years under medical treatment with prescribed drugs like tegretol 40mg per day and gardenal 50mg per day. He is also diagnosed hypertension of the young age with a likely nephropathy origin under dual therapy based on amlodipine 10mg and indapamide 2, 5mg.

The somatic examination is without abnormalities. The ECG showed electrical LVH with apico-lateral biphasic T wave repolarization disorder (Figure 1). The chest X-ray reveals a rounded left para-cardiac opacity at the level of the lower lobe of the lung on the same side without cardiomegaly or abnormalities of the pulmonary parenchyma (figure 2)

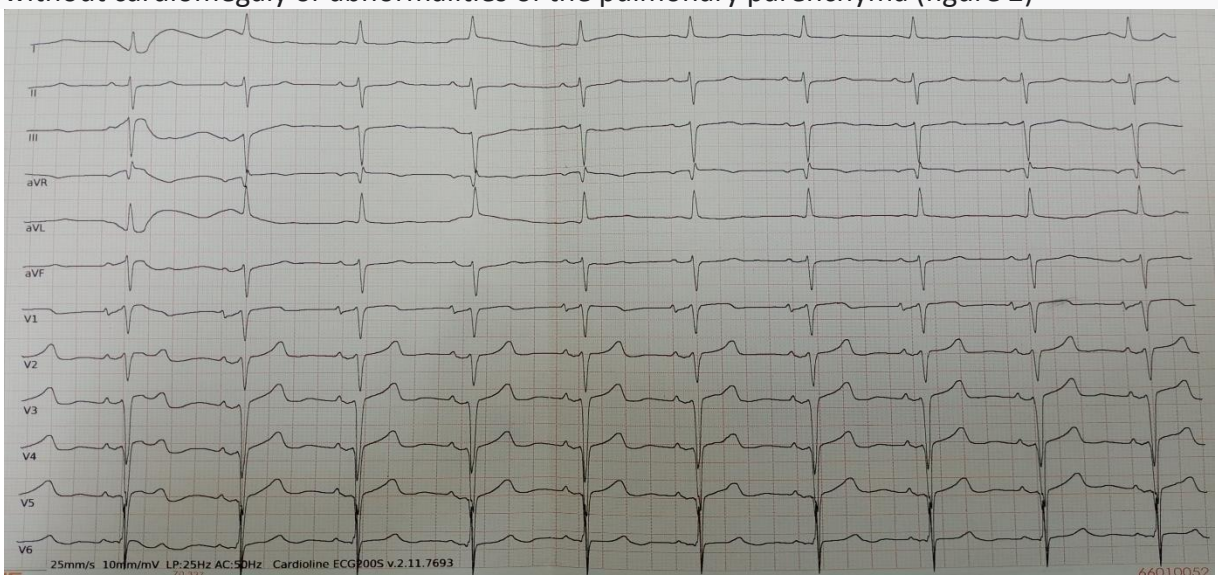

Figure 1: Electrocardiogram: Sinus rhythm: electrical LVH and biphasic T in apico-lateral

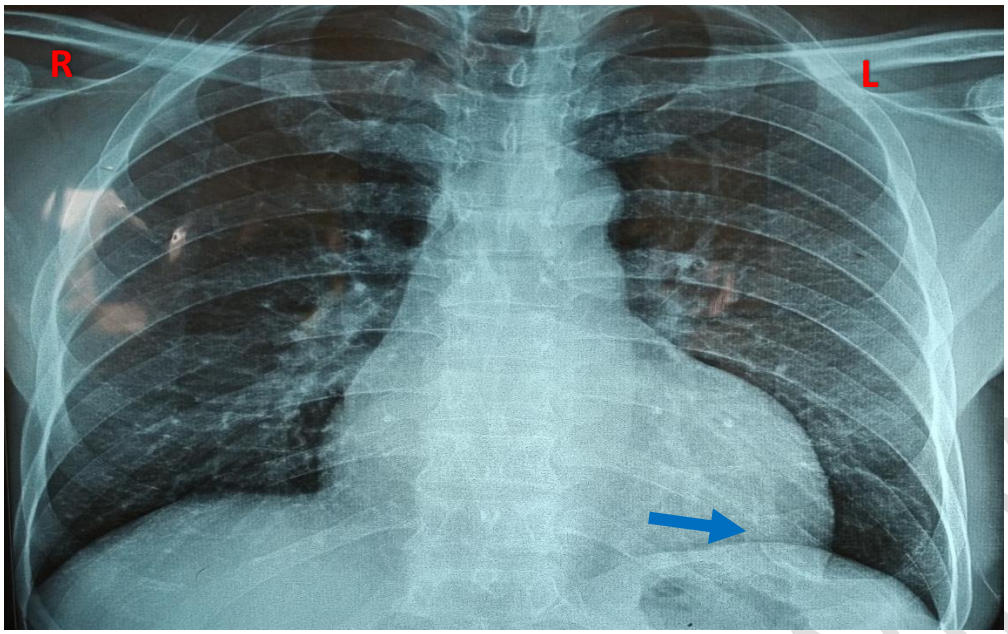

Figure 2: Frontal chest X-ray: rounded opacity well limited to the level of the lower lobe of the left lung without filling of the left costo-diaphragmatic cul-de-sac or parenchymal abnormality (arrow).

Transthoracic echocardiography showed a cystic-like oval formation at the expense of the interventricular septum (IVS) measuring 30mm x 15mm with border edges protruding into the right ventricular cavity with no other signs of cardiac involvement (figure 2).

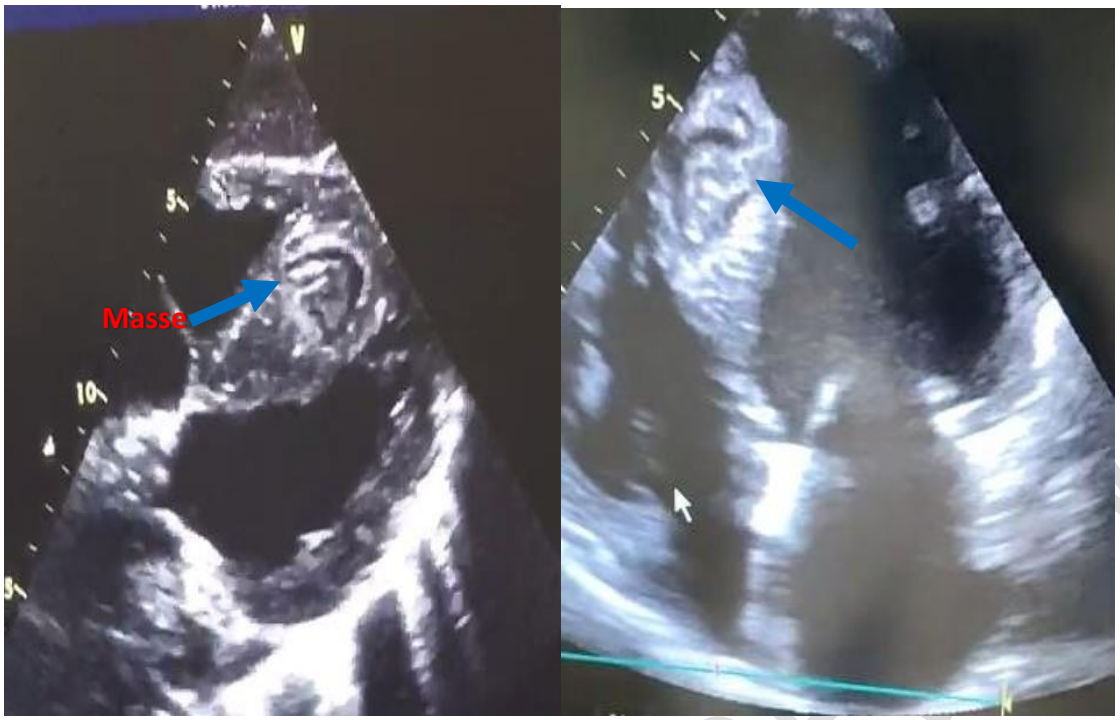

Figure 3: Transthoracic echocardiography: A- long-axis parasternal section: Presence of a cystic formation at the level of the SIV measuring 30mm x 15mm (arrow) with borderline edges. B-section 4 chambers: shows the same mass protruding into the ventricular chamber.

Biological assessment showed hypereosinophilia without any other anomaly.

In front of the rural origin of the patient, radiological and echocardiographic findings, the hydatid attack of the heart is suspected whose hydatid serology by ELISA carried out proved positive.

The radiology findings of multiple locations of hydatid cyst were then completed by a cardiac MRI which conclude a cystic mass with a fibrous capsule of the interventricular septum measuring 50mm x 30mm, of hydatid origin with intra RV apical filling without intra-LV obstruction. This mass does not enhance in the late phase and is not vascularized in the arterial phase. Absence of extracardiac anomaly apart from a 3 mm pericardial effusion blade opposite the lower wall of the LV/RV (figure 3).

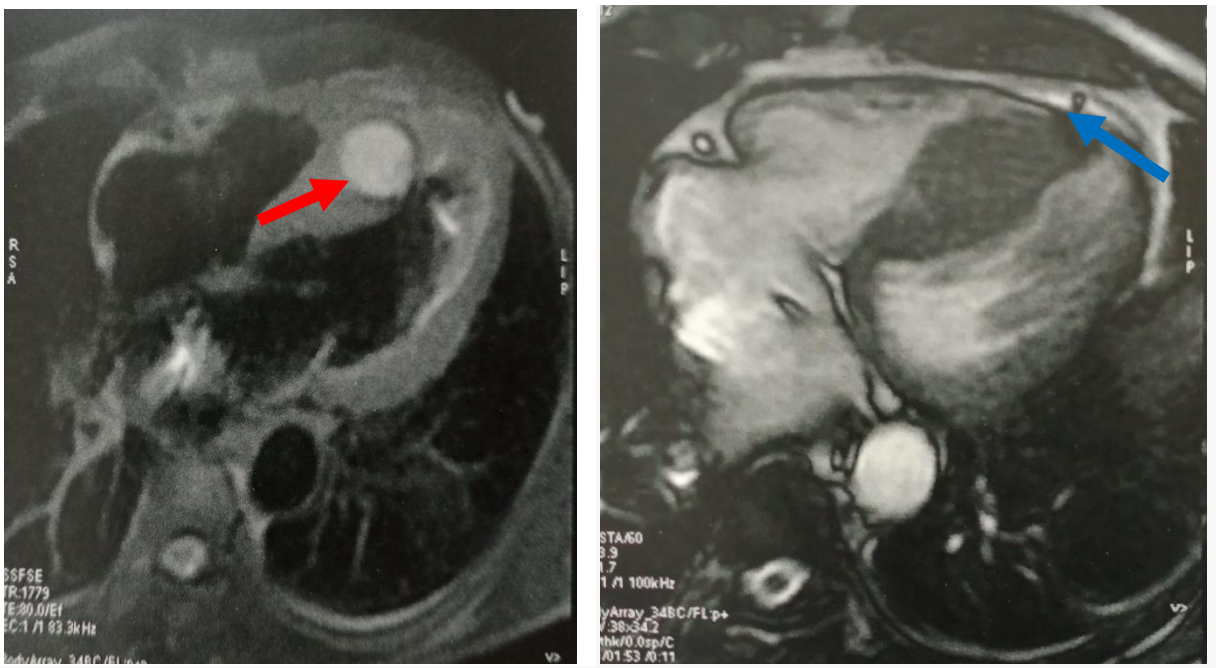

Figure 4: Cardiac MRI, transversal cross-section: Cystic mass with fibrous capsule of the SIV measuring 50mm x 30mm (red arrow) with an effusion blade next to the inferior wall of the LV/RV (blue arrow).

An assessment of extension of the cystic disease including extracardiac assessment by cerebral and thoraco-abdomino-pelvic CT scans revealed 4 cerebral parenchymal formations largely calcified and hypodense with annular enhancement related to hydatid cysts. CT scan appearance of left lung lesions of hydatid origin (figure 4), left renal hypodense patch on chronic pyelonephritic kidney and small aspect of the left renal artery

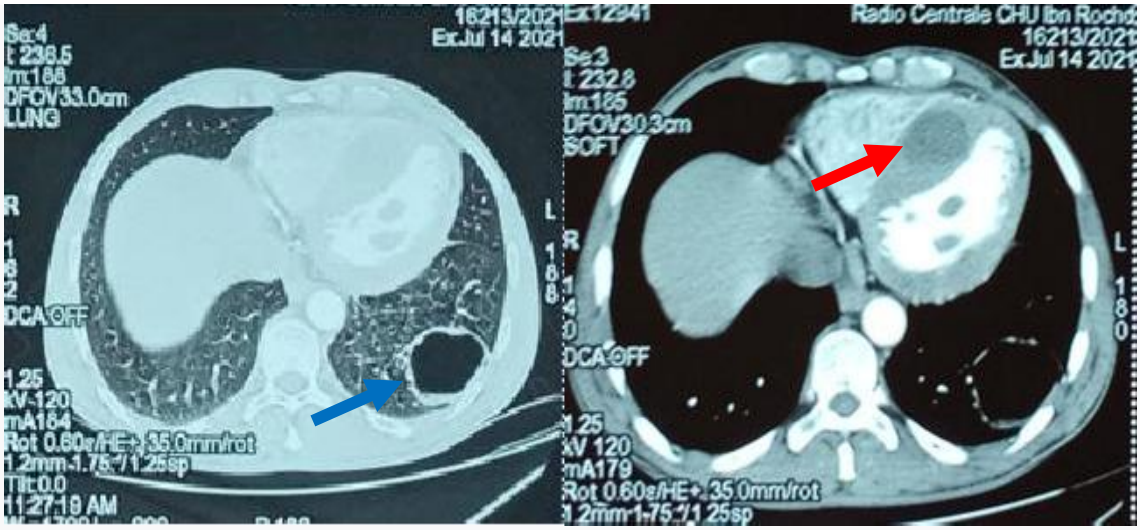

Figure 5: TAP CT scan at the thoracic level: Cross section passing through C5:

A-Parenchymal window: Stage I simple right cyst of the lower lobe of the left lung (blue arrow).

B- Bone window: Cystic lesion of the interventricular septum (red arrow)

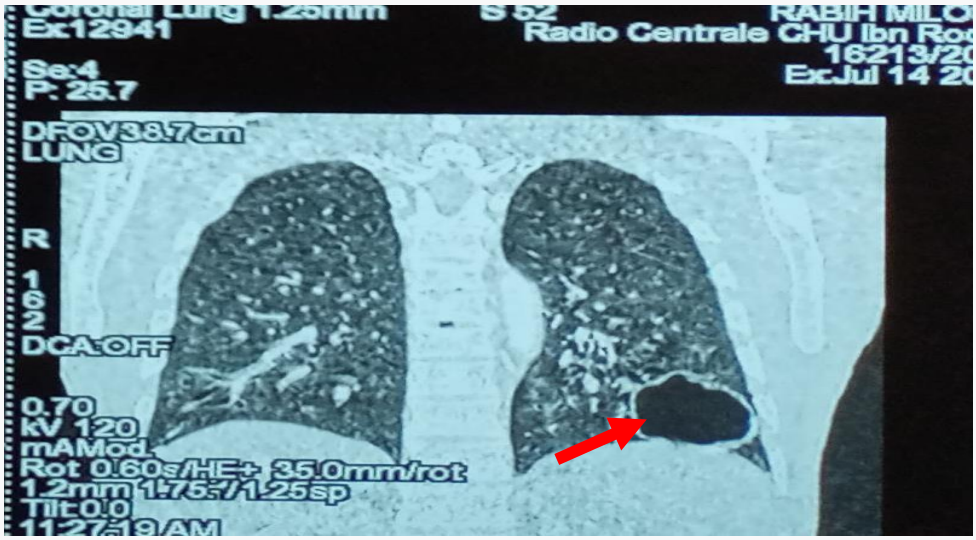

Figure 6: TAP CT scan at the thoracic level: Longitudinal section: Simple hydatid cyst Stage I of the lower lobe of the left lung (arrow)

The patient was refused surgery due to the poor prognosis of his general condition, who died following hemodynamic instability by anaphylactic shock one month after the diagnosis was confirmed despite only the medical treatment prescribed.

Discussion

The hydatid cyst of the heart (HCH) is secondary to the intracardiac development of Echinococcus granulosis. The intermediate host of this parasite is sheep. Humans, the definitive host, become infected by ingesting embryonated eggs which soil a dog's coat or food. The embryo, released in the stomach, crosses the wall of the intestine, the hepatic and pulmonary filter to reach the left heart. From there, it can be distributed in the coronary circulation and end its course in the myocardium where it encysts [4].

The left ventricle (LV) being twice as irrigated as the right, hydatid damage is preponderant on the left (left ventricle 60%, right ventricle 10%, interventricular septum 4%, right atrium 4%) [5,6,7]. The development of intracardiac hydatid cyst is usually subepicardial for localizations in the left heart and subendocardial for those in the right heart, given the low-pressure regime of the right cavities. This explains the possibility of intra-pericardial rupture [5,6] in left localizations, intra-cavity in right attacks.

The clinical presentation of hydatid cyst of the heart (HCH) is very unspecific. The notion of exposure to dogs and sheep, the endemic context or the personal history of other hydatid localizations should suggest the diagnosis [4] as in our case.

The ECG may be normal or show ST segment elevation or depression in the event of myocardial compression or cyst rupture [7]. Biologically, hypereosinophilia can be noted. Hydatid serology is of great diagnostic value but it suffers from false negatives and cross-reactions with other parasitosis [4,9].

Attila has shown that transthoracic echocardiography can reveal unilocular or multivesicular cysts with well-defined contours, with uniform anechoic content, which may calcify, and hypoechoic with multiple septa. Infected hydatid cysts can sometimes appear as echogenic lesions resembling secondary cardiac tumors [7, 10]. More detailed images can be obtained

by transesophageal echocardiography. MRI and CT scan have better sensitivity and specificity than echocardiography in evaluating pericardial masses and analyzing their relationship to surrounding structures. Pulmonary and mediastinal hydatid cystic lesions can also be found [9,11,12]

The evolution of KHC can be burdened with severe complications such as [4]:

- intracardiac rupture with systemic or pulmonary embolic accidents, anaphylactic shock,
- intrapericardial rupture,
- conductive disorders (especially septal location),
- myocardial ischemia

For this, the treatment of KHC must be rapid. It is based on surgical excision. In our case, the patient was rejected for surgery in view of the multiple cerebral and pulmonary localizations, which was complicated by hemoptysis following a rupture of the pulmonary cyst and cerebral engagement, followed by death.

Only high-risk patients or those with a small calcified cyst (indicating a dead cyst) and without hemodynamic complications were considered for conservative therapy [8, 13]. The option of isolated medical treatment has also been proposed as an alternative to surgery in certain cases such as in the elderly or in the event of refusal of surgery [4] as in our case. A combination of corticosteroids, H1 and H2 receptor blockers, and benzodiazepines may be advocated for anaphylactic coverage [14, 15].

Therapy is often in oral form with albendazole 15mg/kg/day.

Conclusion

Cardiac hydatid is a very rare manifestation of hydatid disease. It can have fatal complications of intracardiac rupture, myocardial infarction, ventricular tachycardia,

conduction disorder such as BAV in septal location, sudden cardiac arrest or systemic pulmonary embolism [16].

The diagnosis is suggested by the identification of cysts in a multi septate lesion, presence of hydatid sand and calcification of the walls. Echocardiography is the test of choice for the diagnosis of cardiac hydatid cysts due to its availability, high sensitivity, and ability to concurrently analyze hemodynamic consequences. CT scans and MRI can help pinpoint the location of the lesion and detect other extracardiac locations [17].

This case describes an unusual location of E. granulosis in the heart with brain and lung involvement associated with a poor prognosis.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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