EAS Journal of Parasitology and Infectious Diseases
Abbreviated Key Title: EAS J Parasitol Infect Dis
ISSN: 2663-0982 (Print) & ISSN: 2663-6727 (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-6 | Issue-2 | Mar-Apr- 2024 | DOI: 10.36349/easjpid.2024.v06i02.001

Case Report

Cardiac Localization of Hydatid Cyst: A Case Report

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Article History
Received: 16.02.2024
Accepted: 22.03.2024
Published: 25.03.2024

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: Cystic Hydatid disease is a parasitic infection with a worldwide distribution. Even in endemic areas, including Morocco, cardiac involvement by hydatidosis is very rare but remains serious due to its life-threatening complications. We report a rare case involving a 21-year-old Moroccan man, residing in a rural area, with no previous medical history, who presented to the emergency department with pain in the right hypochondrium. CT-scan and transthoracic echocardiography revealed a cystic mass in the interventricular septum, with the radiological description suggesting the potential presence of hydatidosis. Additionally, two hepatic cystic lesions were concomitantly identified. The imaging-based diagnosis of the hydatid cysts was supported by positive hydatid serology using both techniques: ELISA and Western blot. Subsequently, the patient underwent surgery for resection of the cardiac cyst. Parasitological examination of the surgical samples confirmed the diagnosis of hydatid cyst.

Keywords: Cardiac hydatid cyst, interventricular septum, Echinococcus granulosus, hydatidosis, endemic area, Morocco, rare localization, fatal complications.

INTRODUCTION

Hydatidosis or Echinococcosis is a cosmopolitan anthropozoonosis that represents a serious public health problem, particularly in endemic countries like Morocco. It is caused by the development of the larva of a small tapeworm called *Echinococcus granulosus* [1]. The liver and the lungs are the most common sites for hydatid cysts. Cardiac location is unusual and very rare, occurring in less than 2% of cases, even in endemic countries [2].

Cardiac hydatid cysts have a long incubation period and can remain asymptomatic. Symptoms, if present, are usually atypical, making it difficult to diagnose. Therefore, it can lead to severe and fatal complications, such as anaphylactic shock, tamponade, systemic or pulmonary embolization due to endocavitary rupture, arrhythmia, and sudden cardiac death [3].

Accordingly, a timely diagnosis is crucial, involving both radiological and biological evidence. The conclusive diagnosis relies on direct parasitological examination.

The aim of this study was to describe a case of a hydatid cyst involving the interventricular septum and emphasize the contribution of the biological laboratory to the diagnosis.

CASE PRESENTATION

A twenty-one-year-old man from a rural area in northwestern Morocco (Ain Taoujdate), with no prior medical history, presented to the Emergency Department of the Military Hospital Moulay Ismail in Meknes with pain in the right hypochondrium persisting for the last 10 days.

During the examination, the patient's general condition was stable. Abdominal examination revealed tenderness in the right hypochondrium without the presence of a palpable mass. Physical examinations of other body systems were normal.

Laboratory investigations showed mild eosinophilia of 1.1 G/L (normal range 0 – 0.5 G/L), with normal liver function tests, renal function tests, and a negative troponin.

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The Electrocardiogram showed a depolarization disorder with a negative T wave in V3 and biphasic T wave in leads V2 and V4.

Thoraco-abdominal computed tomography was performed, revealing the presence of an oval intracardiac cystic formation affecting the interventricular septum at the apex, measuring 22x34 mm with a thin wall enhanced after the injection of contrast agent. No abnormalities were observed in the pulmonary parenchyma and pleuropulmonary region. In the abdominal region, two hepatic cystic lesions were noted: The first lesion was located in segment VIII, measuring 30x38 mm, without enhancement following contrast injection. The second lesion involves segment V, measuring 73x64 mm, with a thin wall enhanced after contrast injection, multiloculated at the lower pole, and accompanied by an attached daughter cyst measuring 18.5 mm.

Moreover, trans-thoracic echocardiography revealed a relatively large echo-lucent cystic lesion, measuring 22x34 mm in diameter, affecting the interventricular septum and projecting onto the apex of the right ventricle (Figure 1).

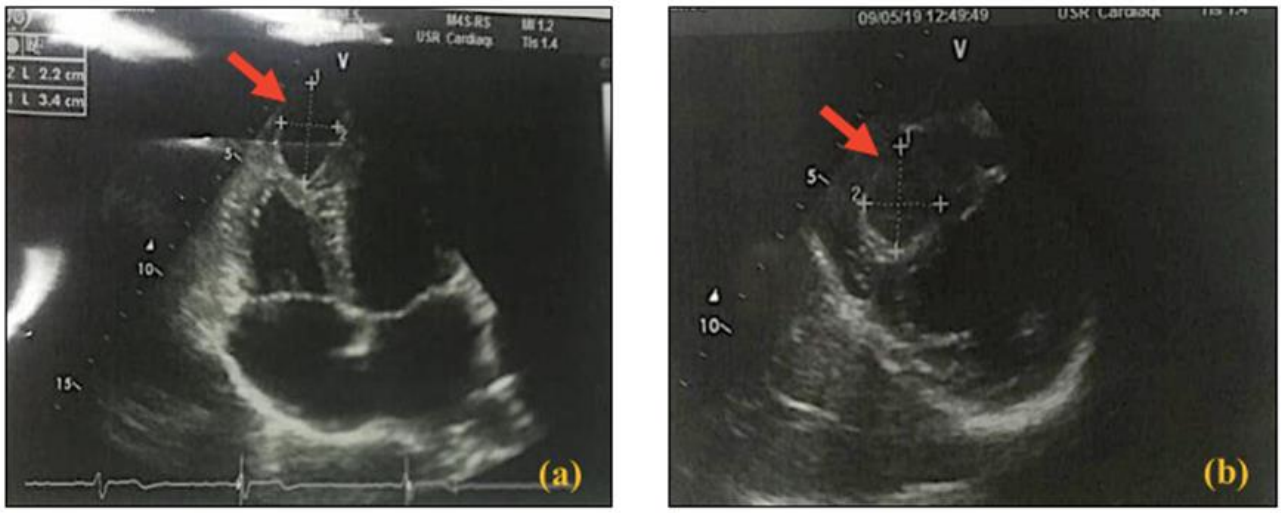

Figure 1: Transthoracic echocardiography with an apical four-chamber view (a) and parasternal short axis view (b), showing a relatively large cystic lesion affecting the interventricular septum and projecting onto the apex of the right ventricle

The radiographic findings of the three cystic lesions, one intracardiac and two hepatic, in our endemic context, initially suggest the possibility of hydatid disease.

The patient was therefore directed to our institution, Mohammed V Military Training Hospital of Rabat, for specialized care and was admitted to the cardiovascular surgery unit.

Hydatid serology using enzyme-linked immunosorbent assay (ELISA) was performed and returned positive, confirmed by western blot IgG assay (LDBIO Diagnostics). The genus Ecchinococcus was identified through the detection of bands at 7 kDa and 26-28 kDa, along with a diffuse band between 16 and 18 kDa, which is considered specific for the species Echinococcus granulosus (Figure 2).

Thereafter, the patient underwent surgery to remove the cardiac cyst. The operative procedure consisted of flattening, aspirating the cyst content, and removing the cyst membranes. The cystic cavity was washed with hypertonic saline solution to prevent systemic contamination by the parasite.

Operative specimens (membranes and fluid) were sent to the parasitology-mycology laboratory (Figure 3). The microscopic analysis of a drop of the aspirated fluid, placed between a slide and a cover slip, along with scraping the inner surface of the membrane using a scalpel blade, revealed the presence of scolex and hooks (Figure 4). The diagnosis of cardiac hydatidosis was thus confirmed.

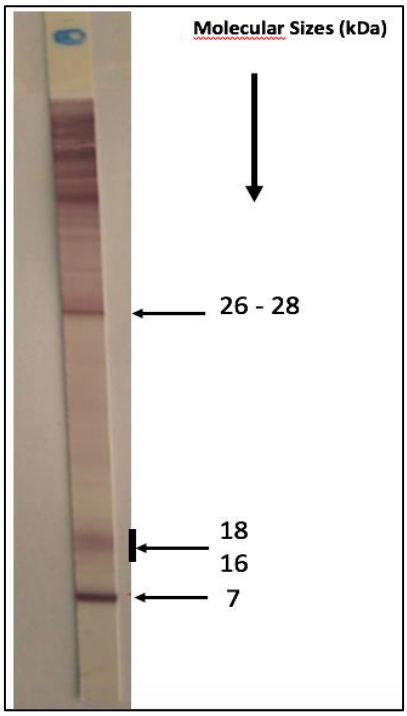

Figure 2: IgG Western blot strip after assay of patient's serum sample: Pattern consistent with Echinococcus granulosus species

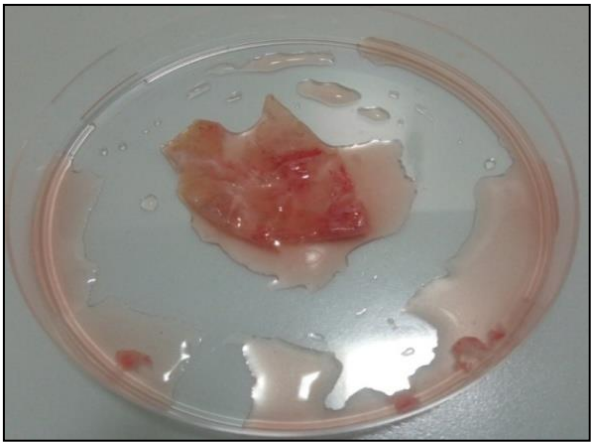

Figure 3: Surgical samples (membranes and fluid) delivered to the parasitology-mycology laboratory

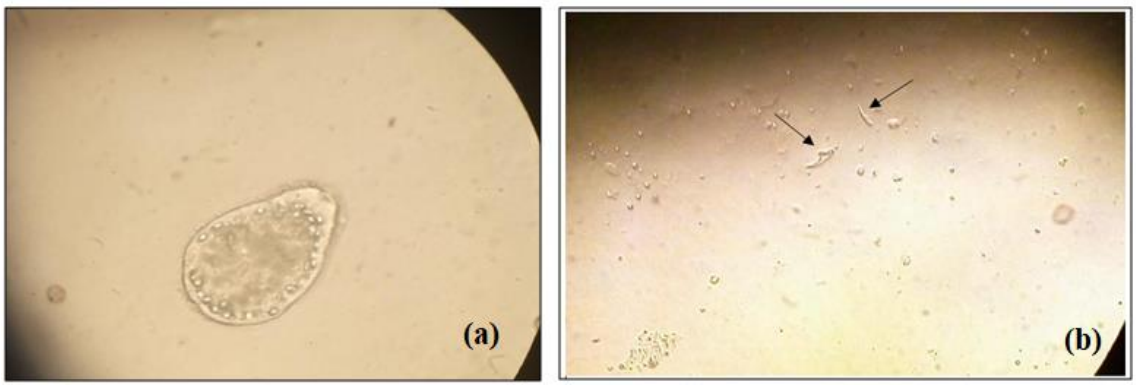

Figure 4: Microscopic view at 10x objective of the surgical samples (membranes and fluid), revealing the presence of scolex (a) and hooks (b), confirming Echinococcus granulosus

The postoperative follow-ups were uneventful, and the patient was started on albendazole therapy. Subsequently, the patient was referred to visceral surgery for the management of hepatic cysts.

DISCUSSION

Hydatidosis is a parasitosis caused by the development of the larval form of Echinococcus granulosus. The definitive host is most often the dog. The intermediate host, contaminated through digestive pathways, is commonly the sheep and accidentally humans. Humans are a parasitic dead end, as they do not transmit the disease [1].

Morocco is an endemic country for hydatidosis, with an incidence of 5.2 cases per 100000 inhabitants [4].

Cardiac echinococcosis is rarely encountered, occurring with a frequency of 0.01% to 2% [2]. The rarity of cardiac hydatidosis can have two possible explanations: firstly, cardiac contractions may prevent the cyst from implanting in the heart, and secondly, the embryo is usually filtered through the liver and lungs [5]. However, a small number of embryos can bypass the vascular bed of the lungs and liver, reaching the myocardium via the coronary circulation [5]. Another possible mechanism for cardiac hydatid cysts is through involvement via the pulmonary veins. Moreover, the ingested larvae can reach the right side of the heart through the superior vena cava and thoracic duct [6].

Although any part of the heart may be affected, the most common location is the left ventricle (60%) due to its large muscle mass and rich parietal vascularization, followed by the right ventricle (15%), the interventricular septum (9%), the left atrium (8%), the right atrium (4%), and the interatrial septum (2%) [7]. In our case, the cyst is situated in the interventricular septum, extending towards the apex of the right ventricle.

Cardiac hydatidosis has been reported in several cases [5-14]. The clinical presentation is nonspecific and varied, ranging from asymptomatic cases to potentially life-threatening complications. It depends on factors such as the location, number, size and the integrity of the cyst. The development of hydatid cysts generally occurs slowly and without noticeable symptoms. However, in some studies, cardiac hydatid cysts were revealed by vascular or nerve compression, leading to symptoms such as chest pain, palpitations, cough, dyspnea, and syncope [5, 7, 8]. Cyst rupture is rare but can be fatal, often resulting in anaphylactic shock, tamponade, or massive cerebral and pulmonary embolism or sudden death [3, 9-11].

In our case, the patient didn't report any cardio-respiratory signs, and the physical examination was normal.

Transthoracic echocardiography is a sensitive and specific tool for diagnosing hydatid cysts in the heart [12]. It allows to locate the lesion, determine its cystic nature, size, and impact on vital structures. It is the preferred non-invasive imaging test, chosen for its effectiveness and lack of cardiac motion artifacts.

Computed tomography (CT) allows better assessment of the location and extent of the cysts.

Cardiac Magnetic Resonance Imaging (MRI) is recommended in cases of diagnostic uncertainty or discordance between CT and echocardiography. It provides precise details on the morphology and topography of the cyst, as well as its anatomical relationships with cardiac structures and surrounding tissues [8]. In our study, MRI was not performed. However, the radiological images are crucial for guiding the surgical procedure.

The CT scan offers the advantage of simultaneously evaluating the extent of the disease through a thoraco-abdominal acquisition, searching for multi-visceral localizations. In our case, the abdominal CT scan showed two hepatic cystic lesions as well as a daughter vesicle in one of them. In fact, in 50% of such cardiac cases, there is multiple organ involvement, especially hepatic or pulmonary [13].

Biologically, hypereosinophilia is inconstant and non-specific. Hydatid serology is essentially used to confirm the hydatid nature of a suspicious radiological image, and has greater sensitivity and specificity in the case of hepatic locations, but less so for other sites. It is positive in only about half of cases of cardiac echinococcosis [14].

Indirect immunofluorescence and ELISA are considered the most sensitive tests commonly used for screening. However, their specificity is limited by cross-reactions with other cestode infections (E. multilocularis and Taenia solium) and even malignant tumors. For confirmation, the immunoblot technique (western blot) is more specific, often leading to the identification of the species Echinococcus granulosus, as was the case in our study [15].

Parasitological diagnosis, achieved through direct examination or anatomopathological analysis of intraoperative samples (biopsies or percutaneous puncture), is considered the exclusive definitive diagnostic method. It shows the head of the adult worm (scolex) and/or the hooks [1]. However, these invasive

procedures are prohibited for diagnostic purposes due to the risk of dissemination.

In our case, the diagnosis of cardiac hydatidosis was established based on radiological findings, the patient's demographic origin and positive hydatid serology.

Surgical excision is the only curative therapeutic option for cardiac hydatid cyst. It must be performed as soon as the diagnosis is made to avoid any possible complications [8], even when the patient is asymptomatic, as in the case of our patient. Albendazole is recommended after surgery as a prophylactic treatment to reduce the risk of recurrence. The duration of post-operative Albendazole varies in different articles. According to WHO guidelines, albendazole is used at a dose of 10 to 15 mg/kg/day in one-month cures spaced 15 days apart, for 6 months [8]. For 5 years after the surgery, echocardiography as well as hydatid serology are recommended to detect a potential recurrence [16].

CONCLUSION

Echinococcosis remains a public health problem in Morocco. Various national and international control programs are dedicated to its prevention, under the guidance of the World Health Organization (WHO). Cardiac involvement remains rare but can lead to fatal complications. The severity of this localization requires systematic echocardiographic screening in every patient with or suspected of hydatidosis, followed by appropriate surgical treatment.

Declaration of Interest: The authors declare have no conflict of interest

Publication Ethics: The article is produced ethically and responsibly, with no fabrication or falsification of data, no plagiarism and no manipulation of images.

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Cite This Article: Soukaina Salah El Kheir, Meryem Karib, Souad Azelmat, Maryem Iken, Badre Eddine Lmimouni, Hafida Naoui (2024). Cardiac Localization of Hydatid Cyst: A Case Report. *EAS J Parasitol Infect Dis*, *6*(2), 8-13.