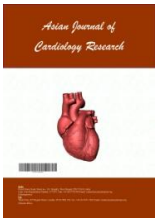

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Echinococcosis of the Right Ventricle: Case Report and Review of the Literature

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Authors' contributions

This work was carried out in collaboration among all authors. Author NM-M designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors BN and AM managed the analyses of the study. Author AM managed the literature searches. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Echinococcosis is a parasitosis that is endemic in many parts of the world. Cardiac involvement is rare at (< 3%) or 0.5-2% of all cardiac involvement let alone right chamber involvement. We have reported a case of a 15 year old girl with echinococcosis of the right ventricle in the interventricular septum. The diagnosis was made in the presence of palpitations, an electrocardiogram showing sinus tachycardia with a right bundle branch block, a hydatid cyst demonstrated by transthoracic echography and cardiac CT scan with confirmation by serology. Management was by resection of the cyst with administration of albendazol 400mg/dr for 1 month and then every 15 days for 6 months with a favourable evolution. Morocco is an endemic area for echinococcus granulosus, which occurs in young people and is predominantly female. There is no characteristic clinical picture of the hydatid cyst of the heart and the clinical symptomatology is variable, depending on the stage of development of the cyst. The diagnosis is made on the basis of a number of arguments, with serological confirmation or, even more so, immunoblot, looking for specific antibodies. Management is done without delay by surgical method: cystectomy associated with aspiration of the liquid remains the most used method in 69% of cases followed by the careful

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padding technique in 62.5% and perikystectomy in 31%. In inoperable forms or as a complement to surgery if there is a risk of insemination, the WHO recommends albendazole at a dose of 10 to 15 mg/kg/day in courses of one month then spaced 15 days apart, for 6 months.

Keywords: Echinococcosis; echinococcus granulosus; right ventricle; hydatid cyst.

1. INTRODUCTION

The tapeworm echinococcus granulosus is the parasite responsible for hydatid cyst (echinococcosis). Echinococcosis is a parasite that is endemic in many parts of the world [1,2]. It causes a number of organ lesions, the most commonly described of which are liver and lung [1]. Cardiac involvement remains rare (<3%), i.e. 0.5-2% of all cases [1,3]. Its right heart location is very serious, due to the low pressure regime favouring its elective endocardial development, responsible for several complications, the mortality of which is around 30% [2]. The clinical manifestations are diverse, only imaging with serological confirmation can make the diagnosis. Management should be immediate with surgical treatment without delay. In this context, we report a case of echinococcosis of the right ventricle in an adolescent girl.

2. CASE REPORT

We report the case of a 15-year-old girl with a history of hydatid cysts in the liver of her father and brother one month ago. She presented with palpitations that had been present for 3 weeks, without any other associated signs. The clinical examination was normal, the electrocardiogram (ECG) noted a complete right bundle branch block (RBB) with a sinus tachycardia 132 beats/min. On transthoracic echocardiography, a liquid intra-right ventricular (RV) mass implanted on the interventricular septum was noted, extending over the apex and measuring 52 x 35 mm, without RV dysfunction. A thoracic CT scan was performed, demonstrating a hydatid cyst in the apicoseptal wall of the right ventricle, protruding into the ventricular lumen and measuring 47x36x39 mm. Biological findings included a hypereosinophilia of 750 µl and a positive hydatid serology. A resection of the hydatid cyst from the apex of the right ventricle was performed. The patient stayed 6 days in hospital under medical treatment consisting of : albendazol 400mg tablets, taken daily for one month and Karegic 75mg sachet per day. The evolution was marked by a disappearance of palpitations and the presence of a residual cavity without hydatid cyst on immediate echotransthoracic examination on the apex of the right ventricle with close monitoring every 6 months and then every year.

3. DISCUSSION

Echinococcosis is a parasitic disease that develops accidentally in humans by ingesting Echinococcus granulosus eggs directly and more rarely indirectly [4,5]. Echinococcus granulosus larvae survive inside the cyst for four to five years. Then the capsule calcifies, the larvae die and may be discovered incidentally during life or postmortem. In contrast, the cyst becomes symptomatic when it exerts pressure on neighbouring structures or ruptures [6]. It is widespread in endemic form in various regions of the world where sheep are reared, such as the Maghreb. In Morocco, it is 5.2 cases per 100,000 inhabitants, with a predominance of females (sex ratio M/F = 0.66) and young adults (59.1% of hydatidosis cases were diagnosed in patients aged 15 to 49 years). Pulmonary and hepatic involvement are the most commonly described lesions, respectively (25-40%) and (50-70%) [1,4-6]. After passing through the hepatic filter, the parasite may reach the right atrium, the right ventricle and then the left heart via the pulmonary circulation after having escaped the pulmonary filter [7]. The parasite reaches the myocardium via the coronary arteries. The importance of the muscle mass and the rich vascularisation of the left ventricle explain the preponderance of hydatid cysts at this level: 60% of cases compared with 10% in the right ventricle, 4% in the interventricular septum, 6% in the left atrium and 7% in the pericardium [3,5,6,8]. Echinococcosis of the heart remains rare, accounting for 0.5-2% of all cases [3,9]. It is a medical emergency and should be diagnosed early to avoid fatal complications [5]. The general symptoms may be those of an anaphylactic reaction with fever and chills, skin rash, dyspnoea and bronchospasm, and even collapse and death [6]. There is no characteristic clinical picture of the hydatid cyst of the heart and the clinical symptomatology is variable, depending on the stage of evolution of the cyst (solitary cyst, closed cyst or ruptured and complicated cyst), its location in relation to the valvular orifices and conduction tissue, and its location in the right or left heart. In the absence of treatment at this

stage, the evolution will be almost inevitable, and this in variable delays, either towards fissuring, or towards rupture in the pericardium or in the cardiac chambers. The location in the right ventricle exposes the risk of hydatid pulmonary embolism with the formation of a post embolic pulmonary heart of acute or chronic evolution [9], while that of the left cavities exposes to an acute serofibrinous or purulent pericarditis and then to a tamponade or a constriction in 10% of cases [3]. The electrical manifestations are mainly characterised by conduction disorders (atrioventricular block, BBD) especially in case of localisation at the interventricular septum [6] and rhythm disorders (atrial fibrillation) [1]. Transthoracic ultrasound is dominated mainly by images with a transsonic contour and therefore a liquid appearance with frequent daughter vesicles or trabeculations [3,10]. More rarely the mass is solid and corresponds to a ruptured cyst. The anechoic appearance immediately points to a fluid mass and raises the suspicion that it is hydatid in an endemic country. However, ultrasound may be deficient in the diagnosis of small cysts (< 0.5 cm), in the diagnosis of degenerated cysts containing membrane residues and necrotic material, and in the distinction between single and multiloculated cysts. Chest CT and especially magnetic resonance imaging are also useful in diagnosis. MRI can penetrate bony structures without significant attenuation of the underlying soft tissue images. Injection of contrast medium is not necessary, as blood provides a natural contrast between the cavity and the cardiovascular structures [6]. Biologically, a hypereosinophilia is the most suggestive biological sign at over 6-7% ; serology has false negatives and cross-reactivity with other parasitoses such as cysticercosis. Recently, a new immunoblot test appears to be highly specific by looking for specific antibodies, n◦ 8 and 116 KDA [6]. However, the diagnosis requires a number of arguments : clinical, biological and especially ultrasound and imaging.

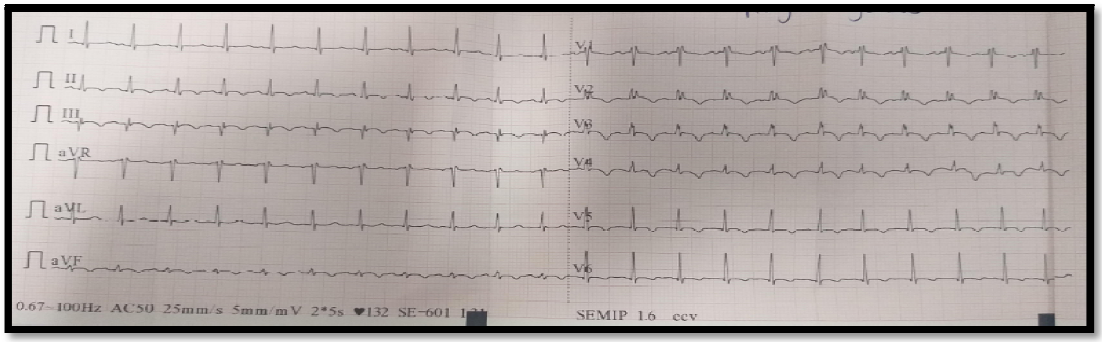

Fig. 1. 12-lead ECG performed in September 2020, in a 15-year-old girl with sinus tachycardia and complete right bundle branch block before surgery

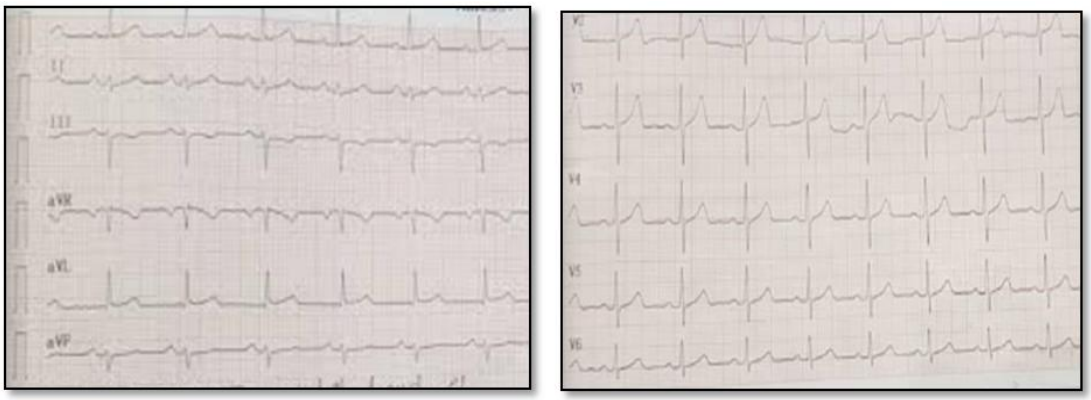

Fig. 2. 12-lead ECG in a 15-year-old patient in sinus rhythm at 75 beats/minute at 06 months after cystectomy

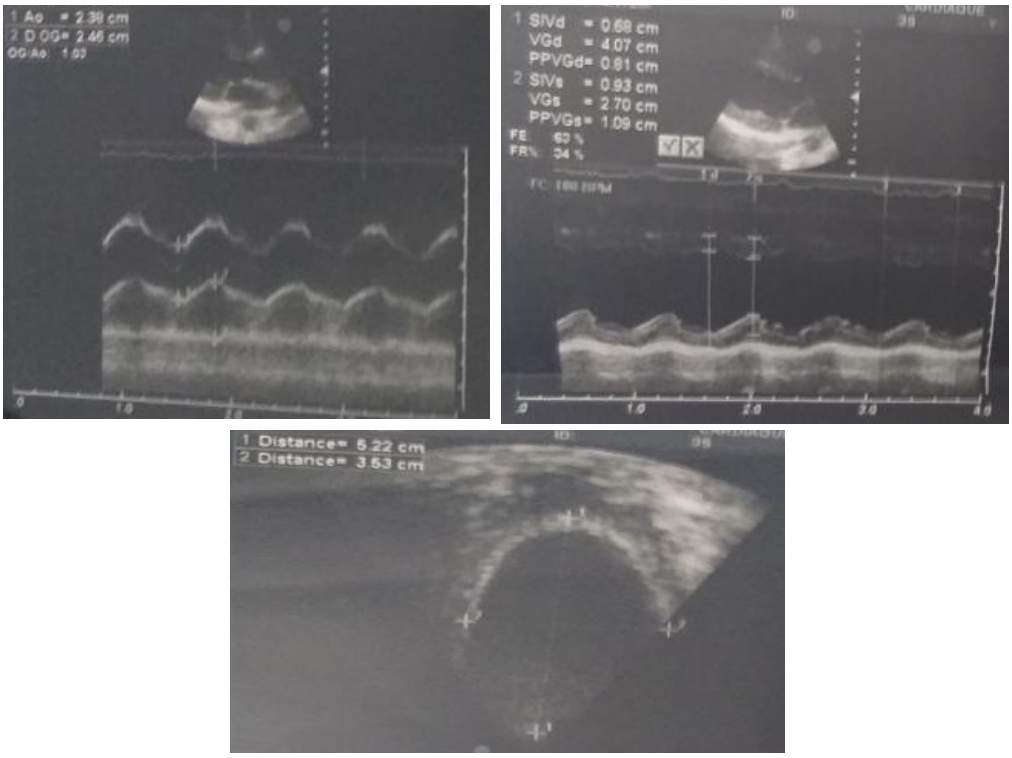

Fig. 3. Transthoracic ultrasound revealed a right intraventricular hydatid cyst measuring 52x35 mm

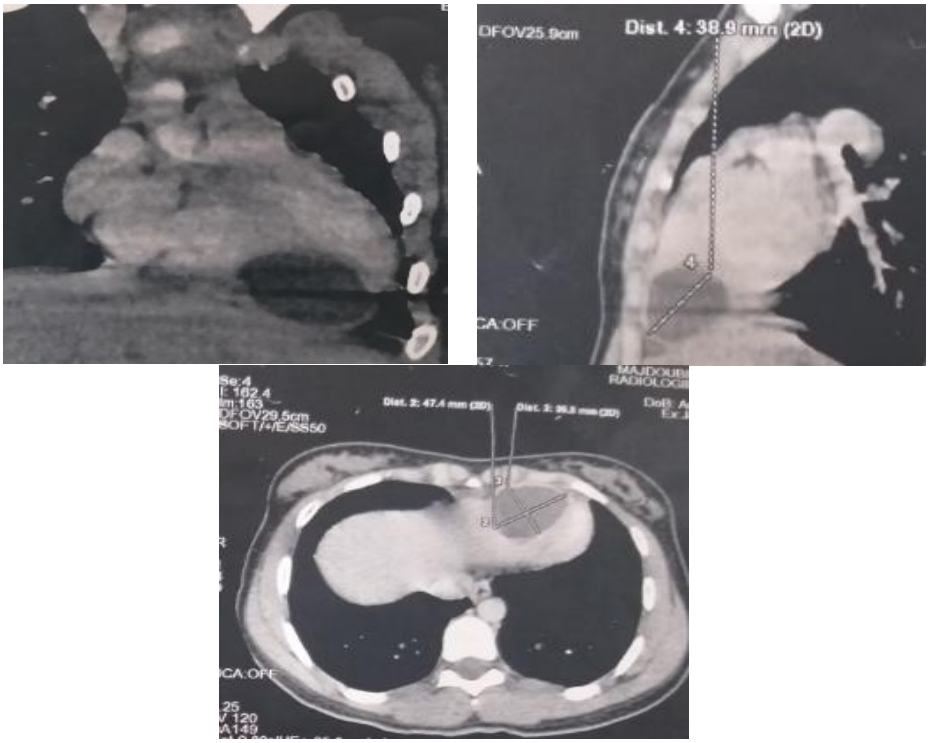

Fig. 4. Cardiac CT scan showing a right intraventricular hydatid cyst

In our case it was a 15 year old girl as reported in the epidemiological data who presented with echinococcosis of the right ventricle present in the interventricular septum, thus representing a rare case of echinococcosis according to the literature. The diagnosis in our case was made on the basis of a set of arguments as reported in the literature, combining an electrocardiogram showing a right bundle branch block, an echocardiogram and a CT scan revealing a hydatid cyst of the right ventricle, confirmed by a positive hydatid serology. Unfortunately, as in the studies, the immunoblot, looking for specific antibodies, was not performed. Finally, management was immediate by resection of the cyst and then aspiration of the fluid, combined with administration of Albendazol 400mg/Dr for 1 month and then 400mg every 15 days for 6 months as recommended by WHO [2,7]. Cystectomy associated with aspiration of the fluid remains the most commonly used method in 69% of cases followed by the careful padding technique in 62.5% and perikystectomy in 31% [1]. The evolution being favourable, our patient was discharged from hospital 6 days after surgery with close monitoring.

4. CONCLUSION

Cardiac echinococcosis is a rare, extremely serious disease with a morbidity and mortality rate of 11.8% due to extreme complications. Once the diagnosis has been made, treatment must be carried out as a matter of urgency.

CONSENT

In accordance with the international or academic standard, the patient's written consent has been collected and retained by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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