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Case Report

Giant cardiac hydatid cyst causing sustained ventricular tachycardia. Successful surgical treatment

Edmy Callalli[1a], Christian Pelaez[2b], José Carlos Armendáriz-Ferrari[2b], Silvana Gonzales[1a], Mercedes Salas[1a], Martín Niño[1c], Anibal Bombilla[1c]

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Authors affiliation
[1] Cardiothoracic Surgery Department, Hospital Nacional Hipólito Unanue. Lima, Peru.
[2] Cardiology Service, Hospital Nacional Hipólito Unanue. Lima, Peru.
[a] Cardiovascular surgeon
[b] Cardiologist
[c] Resident

***Corresponding author**
Edmy Callalli Mattos
Av. Salaverry 575; Edificio DALI - Departamento 2501
+51 992774437

Correo
edmitasi@hotmail.com

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RESUMEN

Cardiac involvement of hydatid disease is rare. In Peru, a country with a high prevalence of this infectious disease, few cases of cardiac hydatid disease have been reported. We present the case of a man with a cardiac hydatid cyst of more than 10 cm in diameter that debuted with malignant arrhythmia and successfully treated with surgery.

Keywords: Echinococcosis; Heart; Arrhythmias, cardiac (source: MeSH NLM).

ABSTRACT

Quiste hidatídico cardíaco gigante causante de taquicardia ventricular sostenida. Tratamiento quirúrgico exitoso

La afectación cardíaca de la enfermedad hidatídica es rara. En Perú, país con alta prevalencia de esta enfermedad infecciosa, se han reportado pocos casos de hidatidosis cardíaca. Presentamos el caso de un varón con un quiste hidatídico cardíaco de más de 10 cm de diámetro que debutó con arritmia maligna, tratado exitosamente con cirugía.

Palabras clave: Equinococosis; Corazón; Arritmias cardiacas (fuente: DeCS Bireme).

Introduction

Echinococcosis is a zoonosis endemic in Peru, and an estimated 1,139 disability-adjusted life years are lost annually from surgical treatment [1]. It is caused by the larval form of *Echinococcus granulosus*. The larval development leads to hydatid cyst formation. The most frequent site of the disease is in the liver (50-70%), followed by the lungs (25-40%). Cardiac location is uncommon and represents 0-5-2% of all sites [2]. The clinical manifestations of cardiac echinococcosis can range from the absence of symptoms to life-threatening complications. In the cases described, surgical management is the treatment of choice [2,3].

Case report

We present a 48-year-old male patient, born in Cerro de Pasco (Peruvian Andean), resident in Lima 20 years ago, with no relevant medical history. One year before his admission to our hospital, he presented palpitations and two spontaneously resolved presyncopal episodes. Two weeks before admission, the patient presented sustained palpitations that led to loss of consciousness and motivated his admission to the emergency department of our hospital. The emergency physical examination showed a Glasgow scale 12/15, blood pressure 120/80 mmHg, heart rate: 120 beats per minute, and temperature 36.5 ºC. Chest examination revealed rhythmic heart sounds, absence of murmurs, and deviation of the apex impulse to the left. The electrocardiogram revealed monomorphic ventricular tachycardia. With these data, the patient underwent electrical cardioversion with two shocks of 200 J. Emergency laboratory tests showed Leukocytes: 9000; Hb: 15 g/dL; neutrophils: 10%; Platelets: 200 000; Troponins: 0.2; creatinine: 0.7 mg/dL. Hydatest (indirect hemagglutination test for the detection of antibodies to Echinococcus Granulosum) was Negative. Chest X-ray: lung fields without alveolar or interstitial infiltrates, growth of cardiac cavities with a deviation of the apex upwards, and cardiothoracic index of 0.78 **(Figure 1A).** The transthoracic echocardiogram showed a heterogeneous hyperechoic intrapericardial image with defined borders located at the apex with compression of the right and left ventricles. The left and right valves were not affected and the function of both ventricles was preserved. Cardiac tomography revealed a heterogeneous image with defined walls, without contrast enhancement, located in the apical part of the right ventricle, with a mean density of 18 HU, dimensions of 10.8x9x8cm **(Figure 1B),** with the apex of the left ventricle deviated towards the left. After discussing the case with the Heart Team, surgical treatment was decided.

Surgical findings

We found a pedunculated and cystic tumor in the right apex compatible with a hydatid cyst measuring 10.5x9x8 cm **(Figure 2A).** When we open the cystic cavity, we show purulent and fetid material, after aspirating said content. The cyst was found in the muscular wall of the apex of the right ventricle without compromising the anterior or inferior wall of the said ventricle, nor did it have communication with the ventricular cavity.

Surgical Technique

We approached throughout a total median sternotomy. Ascending aorta and inferior and superior vena cava were cannulated for cardiopulmonary bypass (CPB) at normothermia. We used anterograde cardioplegic solution (HTK Custodiol®) for cardiac protection. Superior and inferior vena cava were snared to prevent air from entering the CPB system. The apex of the right ventricle anteriorly was placed anteriorly, we opened the cyst wall longitudinally, observing the surgical findings. After performing

Figura 1. A. Frontal chest X-ray showing cardiomegaly, with regular cardiac silhouette and elevated heart apex, lung parenchyma with complete expansion, and free costophrenic and diaphragmatic angles. **B.** Chest tomography showing the approximate dimensions of the cardiac cyst tumor, longitudinal 10.85 cm x anteroposterior 8.47 cm.

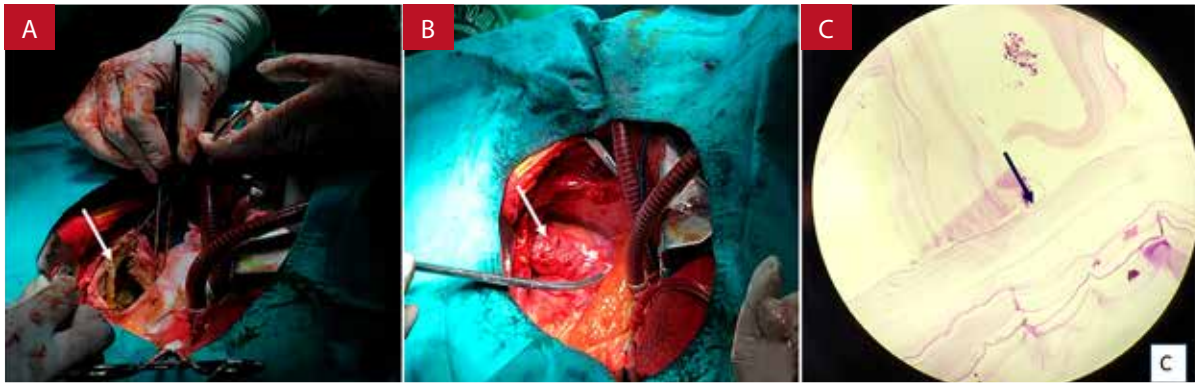

Figura 2. A. Surgical treatment: Opening of the cardiac cyst and evacuation of the content, no communication with the cardiac chambers is evident, and involvement of the interventricular septum is identified. **B.** Surgical treatment: partial capitonage of the cystic cavity with right ventriculoplasty. C. Pathology image. Hematoxylin eosin stain showing the hydatid membranes.

a meticulous cleaning, we resected as much of the external membrane of the cyst as possible. Then, we closed the continuity solution of the ventricle wall with stitches (Polypropylene 3/0) with two Teflon rods simulating the Dor ventriculoplasty **(Figure 2B).** CPB and aortic cross-clamp times were 124 and 100 minutes, respectively.

Follow-up

The patient was disconnected from the mechanical ventilator 12 hours after surgery; however, he remained in the intensive care unit for 4 days due to right ventricular dysfunction. Postoperative transthoracic echocardiography showed preserved left ventricular ejection fraction (55%), and non-dilated right ventricle with right ventricular outflow tract fractional shortening of 36%. During the postoperative evolution, there were no arrhythmia events. The patient was discharged two weeks after surgery. Discharge treatment included Albendazole 400mg/ 12h for three months and Bisoprolol.

Pathological findings

The pathological analysis confirmed the presence of non-viable hydatid membranes **(Figure 2C).**

Discussion

Peru is one of the countries with an endemic prevalence of hydatid disease in Latin America. Junín, Cerro de Pasco (our patient's birthplace), and Huancavelica are the provinces with the highest incidence of hydatid disease [1]. It is reported that the most frequent cases of Cardiac Hydatid (CH) are non-infected cases, with reports of infected cases such as ours being exceptional [2,3].

Due to the slow growth of CH cysts, a growth rate of 0.5-1 cm/year, only 10% are symptomatic. The clinical manifestations are nonspecific: palpitations, syncope, atypical chest pain, dyspnea, and even cough and fever at the beginning of the disease. The electrocardiographic manifestations are also nonspecific, with the most frequent pattern in the different case reports being deep negative T waves, which can be explained by the inflammatory and mechanical effects of the cyst. Other electrocardiographic manifestations described are ST-segment elevation, isolated ventricular extrasystoles, sustained and non-sustained ventricular tachycardia. Depending on the location, acute cyst rupture can cause pulmonary embolism with right heart failure and arterial embolism into the brain, aorta, and arteries of the extremities. Serological tests have a limited diagnostic value, with ELISA being the one with the highest sensitivity and specificity [2-4].

Transthoracic echocardiography is the initial diagnostic test, showing the cysts, their location, number, size, as well as hemodynamic compromise, and probable complications such as pericardial effusion. In case of diagnostic doubt, cardiac CT and cardiac MRI could be performed [4-6].

The heart is infected when hexacanth embryos reach the systemic circulation and the myocardium via the coronary circulation, pulmonary artery, or patent foramen oval. The left ventricle is most frequently involved (55% to 60%), followed by the right ventricle (15% to 25%), the left atrium (8%), the pericardium (8% to 11%), the septum interventricular (5% to 9%) and the pulmonary arteries (7%) due to their greater vascularization. Hydatid cysts of the left ventricle are usually located in the sub-epicardium, while those of the interventricular septum are intra-myocardial [3,7].

Several cases of cardiac hydatid disease have been reported in Peru. Huerta-Obando *et al*., in 2017, reported a case of a 10-year-old patient with CH disease in the interventricular septum measuring 7.2x5.0 cm with associated liver cyst [7]. In 2012, Castillo *et al*. published a case of an 11-year-old patient with a 3.5x3.1 cm cardiac hydatid cyst in the posterolateral wall of the left ventricle associated with a pulmonary cyst [8]. Ramirez *et al*., in 2010, reported a case of a 45-year-old obese patient with CH disease in the left cardiac apex measuring 7.3x5.7 cm associated with a hepatic cyst [9]. In these three cases, surgical

treatment followed by cycles of Albendazole was the successful treatment, which is consistent with other published cases [2,3]. However, Montero *et al*., reported a case of a 21-year-old patient with CH disease in the interventricular septum measuring 5.4x4.4 cm but, they do not mention surgery as a definitive treatment [10].

In conclusion, CH disease is a rare presentation of Echinococcosis, we should suspect it when cardiac cystic tumors are found in patients with the appropriate epidemiological context. Surgical management followed by cycles of Albendazole is the treatment of choice.

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