Case Report

Multimodality Imaging for Diagnosis and Characterization of a Cardiac Hydatid Cyst

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Abstract

Here, we report the case of a young patient admitted to the emergency department because of abdominal pain. Computed tomography revealed a mass within her right heart. Through serial multimodality imaging testing, including computed tomography, three-dimensional (2D)- and three-dimensional echocardiography, as well as cardiac magnetic resonance, the diagnosis of cardiac involvement in the course of *Echinococcus granulosus* infection was hypothesized.

Keywords: Cardiac hydatid disease, cardiac magnetic resonance imaging, echocardiography, multimodality imaging

Introduction

Cardiac masses are uncommon but may pose significant challenges for differential diagnosis, that should be obtained to plan appropriate treatments according to the underlying causative condition. Here we report the diagnostic and therapeutic management of a patient with a cardiac mass finally diagnosed as having cardiac involvement in the course of parasitic infection.

Case Report

A 31-year-old woman, with a history of marginalization and nomadism, presented to the emergency department because of abdominal pain in her right hip. Blood tests and electrocardiogram were unremarkable. Abdominal echography revealed a mass in the liver; hence, a thoracic and abdominal computed tomography was performed, showing two masses in the liver and right ventricle (RV) consistent with a parasitic cyst. Transthoracic echocardiography (TTE) was then performed, revealing a single cardiac cystic mass with anechoic content, multilocular and nonmobile, in the context of RV inflow [Figure 1a and Supplementary Video 1] without signs of obstruction to RV filling. Three-dimensional (3D)-TTE localized the mass within the posterior RV inflow. 3D-TTE aided discrimination between different structures, suggesting the cyst to be intramyocardial [Figure 1b, c and Supplementary Videos 2, 3]. Finally, cardiac magnetic resonance (CMR) was performed. Cine images confirmed the location of the mass, supporting, along with 3D-TTE, the intramyocardial extension [Figure 1d, Supplementary Video 4]. The cyst had high T2 signal intensity, consistent with static fluid content. First-pass perfusion excluded a connection between the mass and ventricular cavity, as contrast did not penetrate within the cyst lumen [Figure 1e and Supplementary Video 5]. Late gadolinium enhancement appeared as a small rim surrounding the cyst [Figure 1f]. According to clinical history and imaging findings, the diagnosis of cardiac involvement in the course of *Echinococcus granulosus* (EG) infection was hypothesized. Because the patient refused surgery, she was initially treated with albendazole 400 mg twice daily, but subsequently lost at follow-up.

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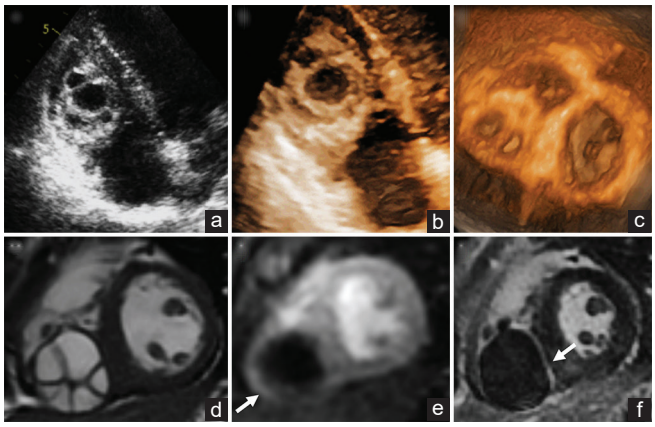

Figure 1: Two-dimensional echocardiography shows a single cardiac cystic mass with anechoic content, multilocular and nonmobile, in the context of right ventricle inflow (a). Three-dimensional-transthoracic echocardiography localized the mass within the posterior right ventricle inflow, possibly with intramyocardial location (b and c). View of the cyst by cardiac magnetic resonance cine-images (d), first-pass perfusion (arrow in e) and late gadolinium enhancement (arrow in f)

Discussion

Cystic echinococcosis is a zoonosis caused by EG,[1] more commonly found within the rural areas of endemic regions.[2] In the present case, the patient's history of nomadism and marginalization was consistent with EG diagnosis,[3] even in the context of a large Western European city. Cardiac echinococcosis (CE) in the course of EG infection is uncommon with an estimated rate <2%, more often affecting the left ventricle.[4] The diagnosis is based on multiparametric assessment including clinical history and serologic and imaging evaluation.[4] Of note, serology might be affected by limitations leading to false-negative results;[5] hence, cardiac imaging has a central role in the CE diagnostic workup. In our patient, two-dimensional (2D)-echocardiography was instrumental in classifying the mass as CE2 and likely active echinococcus cyst,[6] whereas 3D-echocardiography better clarified its intramyocardial location. Localizing the cyst position has important clinical correlates, as it aids surgical planning and might suggest the subsequent development of specific and more severe complications, such as pericardial tamponade in the case of pericardial rupture of the cyst.[7] Finally, CMR added on the diagnostic evaluation, confirming ultrasonographic findings, identifying the fibrotic capsule,[8] and excluding the presence of adjunctive cardiac cysts. The treatment strategy in CE is based on small reports and usually includes the surgical excision of the mass,[9] however, given the patient's reluctance, this was not possible in our case.

Conclusions

We reported an uncommon case of right heart CE, in which multimodality imaging approach provided us with a comprehensive diagnostic evaluation, including accurate cyst localization, hemodynamic impact assessment, and tissue characterization. Our case suggests that irrespective of blood test findings, CE should be investigated by cardiac imaging in suspected individuals.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Consent to participate: the patient provided informed consent for the use of her records for research purpose.

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