

Pericystic Fibrosis of a Cardiac Hydatid Cyst

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Introduction: Cardiac hydatid cysts are rare and represent less than 2% of all hydatid cases. They can occur as part of a widespread systemic infection or an isolated event.

Case Presentation: Here, we presented a case of cardiac hydatid cyst in interventricular septum.

Conclusions: The case presented had some findings that suggested the specific diagnosis of hydatid cyst.

Keywords: Hydatid Cyst; Cardiac; Magnetic Resonance Imaging

1. Introduction

Hydatid disease is a parasitic infection caused commonly by *Echinococcus granulosus* and less frequently *Echinococcus Multilocularis*. It is endemic to many parts of the World. In humans, the most common organs exposed to this disease are the lung and liver; but cardiac involvement is very rare and occurs in less than 2% of cases (1). Cardiac hydatid disease manifestations are non-specific so imaging plays a significant role in the diagnosis. We presented a case of cardiac hydatid cyst in interventricular septum.

2. Case Presentation

A 62-year-old woman, with history of hypertension presented with functional class II exertional dyspnea, fatigue and nonspecific chest discomfort from three months ago. The only finding in physical examination was S1 splitting. The ECG showed sinus rhythm and a right bundle branch block. Transthoracic echocardiography (TTE) demonstrates increased anteroseptal wall thickness with significant asymmetrical septal hypertrophy (ASH), normal ejection fraction (EF), grade I diastolic dysfunction and mild RV enlargement. The patient referred for cardiac magnetic resonance imaging (CMR) to differentiate hypertrophic cardiomyopathy from septal mass. CMR revealed a large well-defined, isosignal septal

intensity mass within the LV anteroseptal wall in the SSFP sequence (Figure 1). Short-axis STIR sequence showed an intramyocardial cystic lesion with a hypointense signal intensity (Figure 2) and delayed contrast-enhanced cardiac MR images demonstrated intense peripheral capsular enhancement which may be related to pericystic fibrous reactive myocardial tissue (Figure 3). First pass perfusion cardiac MR imaging demonstrated a nonperfused anteroseptal mass surrounded by perfused myocardium (Figure 4).

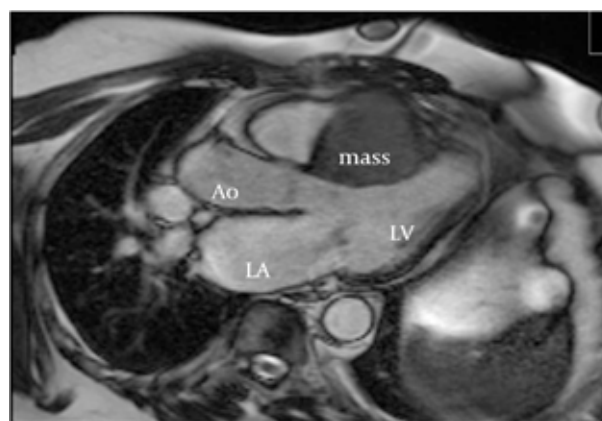


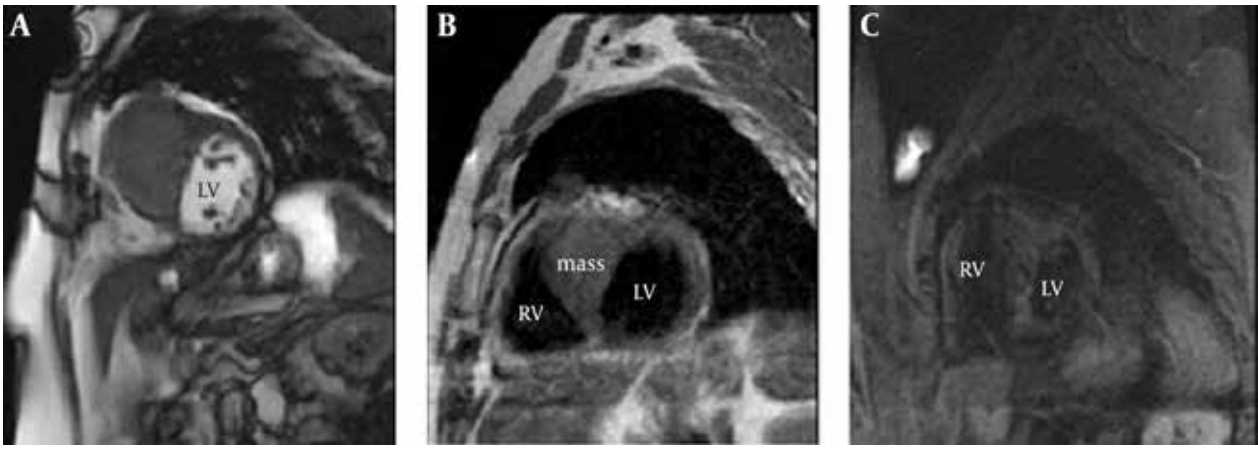
Figure 1. Steady State Free Precession 3 CH View Demonstrates a large Well-Defined Mass Within the LV Anteroseptal Wall

Implication for health policy/practice/research/medical education:

It is a fantastic case of cardiac hydatid cyst in interventricular septum.

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Figure 2. Cardiac Magnetic Resonance Images



A) Steady-state free-precession short-axis demonstrates a large well-defined mass within the LV septal wall, B) short-axis TSE T1-weighted imaging shows an increased anteroseptal thickness with an isosignal septal signal intensity, C) short-axis STIR sequence shows an intramyocardial cystic lesion with a hypointense signal intensity

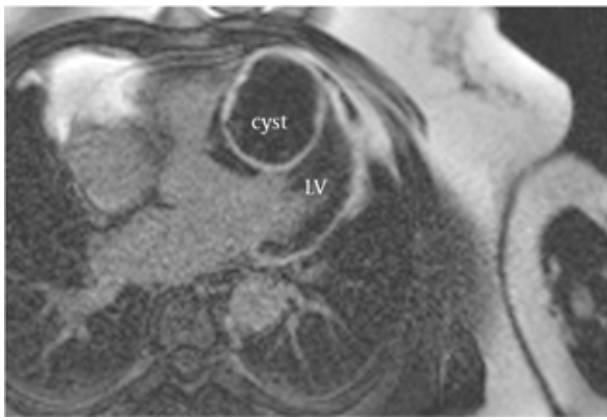


Figure 3. Off Axis Delayed Contrast-Enhanced Cardiac MR Imaging Demonstrating Intense Peripheral Capsular Enhancement Related to Pericystic Fibrous Reactive Myocardial Tissue

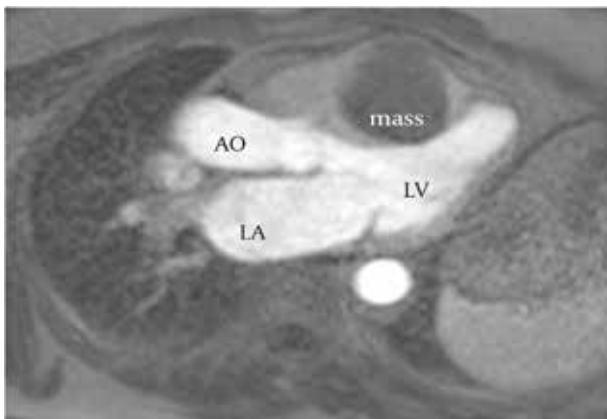


Figure 4. First Pass Perfusion Cardiac MR Imaging Demonstrating a Non-Perfused Anteroseptal Mass Surrounded by Perfused Myocardium

3. Discussion

Hydatid cyst, which is produced by the larvae of the parasite, *Echinococcus granulosus*, most commonly affects the liver or lungs. Cardiac involvement is uncommon and accounts for only 0.5%-2% of cases. Symptoms may be absent or non-specific, and include chest pain, dyspnea on exertion, palpitations, fever, or conduction alterations. The most serious potential complication is cyst rupture, which can trigger anaphylactic shock, cardiac tamponade, or pulmonary or systemic embolization (2). In this particular case, the patient experienced chest pain as well as a right bundle branch block. This electrocardiographic finding may be due to the compression on the right bundle from the cyst itself (3). Histologically, hydatid cyst consists of three layers including the protective outer layer or pericyst formed principally by fibrous reactive tissue of the host; the middle layer of permeable laminated membrane; and the inner or germinal layer (3, 4). MRI can adequately characterize the cystic nature of the lesion, with the typical hypointense ring of the wall and internal laminated appearance (5). The peripheral ring corresponds to the pericyst, comprised of fibrous reactive myocardial tissue. In the case presented, the pericyst could be clearly seen on delayed contrast-enhanced cardiac MR imaging, which showed intense peripheral enhancement of the lesion. Transthoracic echocardiography (TTE) is the initial imaging method of choice for most patients, but findings are highly variable and non-specific across a range of infectious and inflammatory conditions; thus, its diagnostic value is often limited. In particular, TTE provides only limited tissue characterization. The main benefit of TTE is assessment of left ventricular wall motion abnormalities, functional and valvular assessment, and detection of any associated pericardial effusion. Transesophageal Echocardiography (TEE) can

provide a more detailed evaluation, especially for detection of vegetations of endocarditis and is the modality of choice in this respect (6). Gallium-67 citrate scintigraphy is an excellent technique for imaging chronic inflammation and has clinically proven usefulness in detecting myocarditis. However, it suffers from poor spatial resolution and lacks specificity, and, as a result, has largely been replaced by more advanced imaging techniques (7). ECG-gated multidetector cardiac CT (MDCT) angiography provides high-spatial-resolution images (0.4–0.6 mm) of cardiac and great vessel anatomy, and the latest generation dual-source systems also provide high temporal resolution (75 ms). MDCT is the most sensitive technique for detecting calcification and the lung and mediastinal changes that may be seen through some chronic cardiac inflammatory processes. The main limitation of MDCT is lack of inherent soft-tissue contrast, which limits its ability to depict regional differences in image intensity between normal and abnormal myocardium (8). MDCT also involves ionizing radiation and exposure to potentially nephrotoxic contrast agents. Cardiovascular MRI allows anatomic and functional imaging with high spatial and temporal resolution and is the only modality to provide in-depth myocardial tissue characterization. As such, it enables detection of subtle wall motion abnormalities or altered tissue composition that may not be conspicuous with competing modalities. Cardiovascular MRI currently forms the mainstay in the diagnosis of infectious and inflammatory conditions of the heart, except for infective endocarditis. In the case presented, the pericyst could be clearly seen through delayed contrast-enhanced cardiac MR imaging, which showed intense peripheral enhancement of the lesion. The case presented had some findings that suggested the specific diagnosis of hydatid cyst: 1) a hypointense external fibrous layer on T2-weighted MR sequences that markedly enhanced delayed contrast-enhanced images related to pericystic fibrous reactive myocardial tissue. 2) Septal location of a round intramyocardial mass. The serological tests confirmed the diagnosis of cardiac hydatid disease and the pathology report after surgery confirmed the same diagnose.

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Authors' Contribution

Zahra Alizadeh Sani, preparing case report and performing, and analysis CMR result; Mohammad Vojdanparast, preparing case report and following the patient; Alireza Heidari Bokavoli, preparing the case report and doing perioperative echocardiography; Azin Seifi, helped us in patient management.

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