Indian Journal of
Applied Radiology

Open Science Publications

Volume 11, Issue 1 - 2025

www.opensciencepublications.com

Rare Coexistence of Left Ventricular and Pericardial Hydatid Cysts: A Multimodal Imaging Case

Case Report

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Article Information: **Submission: 21/03/2025; Accepted: 28/04/2025; Published: 05/05/2025**

Abstract

Intracardiac hydatidosis is a rare but potentially fatal manifestation of Echinococcus granulosus infection. Left ventricular involvement is the most common cardiac site, but pericardial involvement is unusual. We report a rare case of a 45-year-old male with left ventricular and pericardial hydatidosis, who came to the department of radiodiagnosis of Moti Lal Nehru Medical College, Prayagraj for cardiac CT with coronary angiogram, with complaints of chest pain and exertional dyspnoea. Imaging revealed two multiloculated cystic lesions, one each in the left ventricular myocardium and pericardium, respectively.

Introduction

Hydatid disease, also known as echinococcosis or hydatidosis, is a parasitic infection caused by the larval stage of tapeworms of the genus Echinococcus. The two most common species that cause disease in humans are Echinococcus granulosus and Echinococcus multilocularis. The liver is affected in approximately 60-80% of cases, while the lungs are involved in 20-30% of cases [1,2]. Cardiac involvement is rare with an incidence of 0.5%–2% in systemic hydatidosis cases [3-5], due to the strong myocardial contractility and continuous coronary circulation, which prevent cyst implantation. When cardiac hydatidosis occurs, the left ventricle is the most frequently affected site (due to its rich supply), followed by right ventricle, pericardium, pulmonary artery, left atrial appendage, and interventricular septum [6]. Pericardial involvement is even rarer but can lead to serious complications such as pericardial effusion, tamponade or constrictive pericarditis. We report a rare case of left ventricular and pericardial hydatid cysts, diagnosed through multimodal imaging.

Clinical History

A 45-year-old male, an egg vendor by occupation, presented with complaints of chest pain and progressive exertional dyspnoea for three months with no history of fever or weight loss.

The patient hails from a rural area with frequent exposure to livestock, including cattle and dogs, known intermediate and definitive hosts of Echinococcus granulosus. His occupation as an egg vendor often brought him into direct contact with potentially contaminated environments, increasing the risk for parasitic exposure. The region is known for endemic echinococcosis [8], which further supported clinical suspicion.

Clinical Examination

- Vital signs: PR: 96 bpm, BP: 110/65 mmHg, SpO_2: 98%.
- Cardiovascular: mild tachycardia, normal heart sounds, no murmurs.

ISSN: 2581-3919

- Respiratory: Normal breath sounds.

Investigations

Blood Tests:

- Mild eosinophilia (Absolute Eosinophilic Count: 550 cells/cu.mm.)
- Normal liver and renal function tests.

Imaging:

- **2D Echocardiography** revealed a well-defined, multiloculated cystic lesion in the left ventricular wall showing peripheral calcifications, with no intracavitary obstruction [Figure 1a] and another similar cystic lesion within the pericardial cavity, adjacent to the left ventricle, without any signs of tamponade [Figure 1b]. No significant hemodynamic obstruction noted.
- **Chest X-ray** revealed a well-defined lobulated left paracardiac radioopacity. No other abnormal intrapulmonary opacity seen[Figure 2].
- **Non-contrast and Contrast-enhanced Cardiac CT with Coronary angiography** revealed A non-enhancing, well-defined, multiloculated cystic lesion with peripheral calcification within the mid-lateral wall of left ventricular myocardium [Figure 3a, 3b]. Another multiloculated cystic lesion was noted in the left lateral pericardium adjacent to the left ventricular wall, suggestive of pericardial involvement [Figure 4a, 4b].
- **Cardiac MRI:** T2-weighted images revealed hyperintense cystic lesions in the left ventricle and pericardium.No significant pericardial effusion or thickening noted[Figure 5a, 5b].

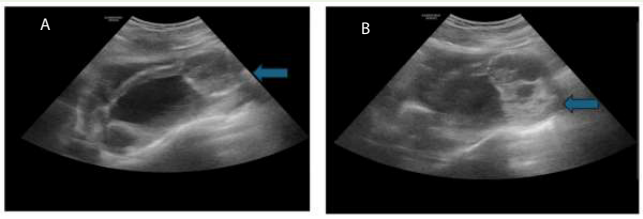

Figure 1: a: 2D Echocardiography image shows a well-defined, multiloculated cystic lesion in the left ventricular free wall showing peripheral calcifications. Figure 1b: 2D Echocardiography image shows second cystic lesion within the pericardial cavity, adjacent to the left ventricle.

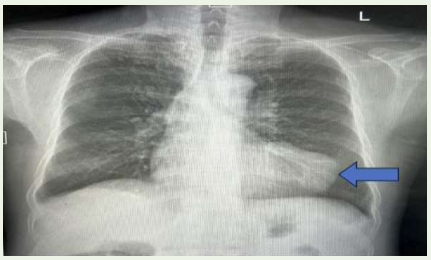

Figure 2: Chest Xray PA view showing well defined lobulated left para cardiac radioopacity.

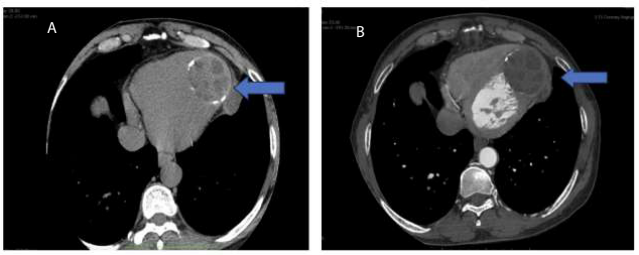

Figure 3: a: Non-Contrast Cardiac CT reveals a well-defined, multiloculated cystic lesion with peripheral calcification within the mid-lateral wall of left ventricular myocardium.
Figure 3b: Contrast Enhanced CT shows no enhancement in the lesion.

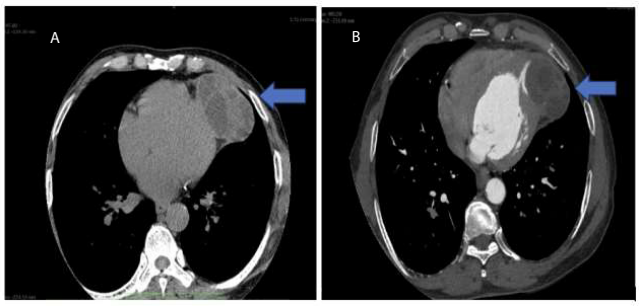

Figure 4: a: Non-Contrast Cardiac CT reveals a well-defined, multiloculated cystic lesion in the left lateral pericardium adjacent to the left ventricular wall
Figure 4b: Contrast Enhanced CT shows no enhancement within the lesion.

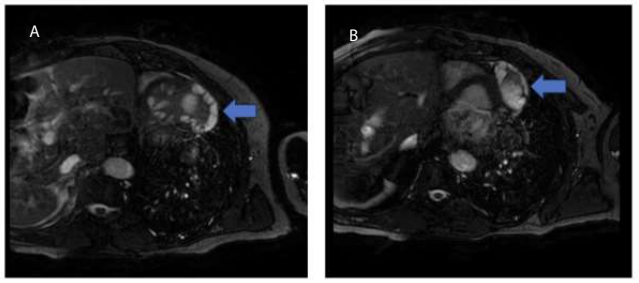

Figure 5: a: T2-weighted image showing hyperintense cystic lesion in the left ventricular wall.
Figure 5b: T2-weighted image showing similar lesion in pericardium adjacent to left ventricle.

Diagnosis

Based on multimodal imaging and blood tests, the patient was diagnosed with intracardiac hydatidosis involving the left ventricular myocardium and the pericardium.

Management

The patient was initiated on Albendazole at a dose of 15 mg/kg/day, divided into two doses (400mg each), with meals. Treatment was planned for at least 3months, with periodic liver function monitoring and complete blood counts. The patient tolerated the initial course well and was advised to continue under close outpatient follow-up.

The patient was referred to a cardiothoracic surgical unit at

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a higher centre for further evaluation. However, due to financial constraints, he initially deferred surgery and opted for continued medical management. At the last follow-up (3 months post-diagnosis), the patient reported symptomatic improvement. A repeat echocardiogram showed no significant change in cyst size or cardiac function. Surgical excision remains under consideration pending affordability and logistic support.

Diagnostic Considerations

- Echocardiography is the first-line investigation.
- CT provides detailed information on cardiac anatomy, cyst walls and calcifications, and is excellent for detecting complications such as cyst rupture and pericardial effusion. It can also be used for preoperative planning
- MRI provides detailed anatomical information with superior soft tissue contrast and differentiates hydatid cysts from cardiac tumours.
- Serology confirms echinococcal infection but has variable sensitivity.

Discussion

While cardiac hydatidosis itself is uncommon, simultaneous involvement of both the left ventricle and pericardium is exceedingly rare, with only isolated cases reported in literature [3-7]. This dual-site presentation adds significant novelty to the present case and underscores the importance of multimodal imaging in capturing such atypical distributions.

Cardiac hydatidosis is a diagnostic challenge due to its non-specific symptoms [3,7]. The left ventricle, being highly perfused, is the most common site, while pericardial involvement is rare [5]. Pericardial hydatidosis may occur due to cyst rupture or hematogenous spread [4]. A multimodal imaging approach, especially involving echocardiography, CT, and MRI, is essential for diagnosis.

Echocardiographic Findings

Transthoracic echocardiography (TTE) is often the **first-line modality** for detecting cardiac hydatid cysts. It allows real-time assessment of cyst location, internal structure, wall calcification, and relation to adjacent cardiac chambers. On echocardiography, cardiac hydatid cysts typically appear as **anechoic or hypoechoic, well-defined, multiloculated cystic masses**, occasionally with internal septations or "daughter cysts" [**6**]. Calcification may be seen as echogenic foci along the cyst wall. In our patient, TTE revealed a well-circumscribed multiloculated cyst in the left ventricular wall with peripheral calcifications and another similar lesion in the pericardial space without hemodynamic compromise.

In their review, [**3**] emphasized echocardiography as a critical diagnostic tool in early detection, particularly for intramyocardial cysts. However, visualization may be limited in posterior or apical regions, prompting the use of additional cross-sectional imaging.

CT Findings

Cardiac CT, particularly contrast-enhanced cardiac CT, is pivotal in assessing the anatomical detail and complications of cardiac hydatidosis. The typical CT appearance is that of a well-defined, hypodense, non-enhancing cystic lesion with a multiloculated configuration and calcified margins. CT is superior to echocardiography in detecting wall calcifications and pericardial involvement. It is also valuable in preoperative planning, especially when vascular or coronary artery encroachment is suspected [6].

In our case, non-contrast and contrast-enhanced CT revealed two well-marginated, non-enhancing multiloculated cystic lesions, one in the mid-lateral wall of the left ventricle showing peripheral calcifications and the other in the left lateral pericardial space,these findings are consistent with the typical CT morphology described by Dursun et al. (2008) [6], who reported that calcified cyst walls and internal septations are hallmark signs of hydatid disease on CT. The lack of enhancement helped differentiate the lesions from solid cardiac neoplasms.

MRI Findings

Cardiac MRI is regarded as the most sensitive modality for characterizing hydatid cysts due to its superior soft tissue contrast, multiplanar capabilities, and ability to differentiate cystic from solid lesions. On T1-weighted sequences, hydatid cysts are typically hypointense, while on T2-weighted images, they appear markedly hyperintense, reflecting their fluid content. The presence of a hypointense rim ("pericyst") may be seen. Internal septations and daughter cysts further support the diagnosis [6, 7].

Our patient's MRI findings corroborated these classic imaging features: both lesions appeared hyperintense on T2-weighted sequences without any solid components, suggesting a purely cystic nature. The absence of pericardial thickening or effusion further excluded constrictive pericarditis.

In a systematic review by Banisefid et al. (2023) [7], MRI was highlighted for its ability to detect small cysts, distinguish hydatid cysts from thrombi or neoplasms, and assess involvement of surrounding myocardium and pericardium. Additionally, the MRI "snake sign" or "floating membranes" can be seen in complicated or ruptured cysts, although not present in our case.

Differential Diagnosis and Diagnostic Integration

The differential diagnosis for intracardiac cystic lesions includes congenital cysts, thrombi, neoplasms (e.g., myxomas, cystic tumours), and infectious granulomas (e.g., tuberculomas).

Differentiation from other intracardiac cystic lesions was essential. The non-enhancing nature on contrast CT and MRI ruled out vascularized neoplasms such as myxomas or cystic tumours. Absence of solid components and lack of gadolinium enhancement further excluded malignant masses. Thrombi were considered unlikely due to the well-defined, multiloculated morphology and peripheral calcifications, atypical for thrombotic material. Congenital cysts (e.g., pericardial cysts) were ruled out based on the bilateral (intramyocardial + pericardial) distribution, which is highly atypical. These features collectively pointed toward hydatid disease.

While serological tests (ELISA, indirect hemagglutination)

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support diagnosis, they may have limited sensitivity in isolated cardiac disease [1, 2]. Hence, imaging remains the cornerstone for diagnosis, monitoring, and pre-surgical planning.

Conclusion

Intracardiac hydatid cysts are rare but can lead to significant morbidity if undiagnosed or untreated. Multimodal imaging plays a pivotal role in accurately identifying cardiac and pericardial involvement, guiding diagnosis, and aiding in preoperative planning. Through detailed imaging findings and clinical correlation, this case highlights the importance of considering hydatid disease in the differential diagnosis of intracardiac masses, especially in endemic regions or in patients with occupational exposure.

Early diagnosis and appropriate surgical intervention can significantly reduce morbidity and improve outcomes in such rare cases.

Acknowledgments

We would like to thank the patient for his cooperation and providing consent to share the details of this case. We also acknowledge the support of our colleagues and technicians in the Department of Radiology and Cardiology for their valuable input and assistance in the diagnosis and management of this case.

Conflicts of Interest

We declare that there are no conflicts of interest related to this case report.

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