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ISOLATED MITRAL VALVE HYDATID CYST MIMICKING MYXOMA: A RARE CASE OF MITRAL VALVE ECHINOCOCCOSIS

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ABSTRACT

Background: Cardiac involvement by *Echinococcus granulosus* is extremely rare, accounting for less than 2% of all hydatid disease cases. When it occurs, it commonly affects the left ventricle, while valvular involvement is exceedingly unusual.
Case Presentation: We present the case of a 74-year-old woman from rural Georgia who developed progressive exertional dyspnoea and fatigue. Physical examination revealed multiple murmurs, and transthoracic echocardiography identified a mobile, hyperechoic mass attached to the posterior mitral valve leaflet. Transoesophageal echocardiography raised suspicion for a myxoma or vegetation, and surgical excision was pursued due to embolic risk. Intraoperatively, a teardrop-shaped cystic mass containing multiple daughter cysts was found on the P2 segment of the mitral valve. Histopathology confirmed a hydatid cyst, consistent with cardiac echinococcosis. The patient underwent successful segmental excision of the cyst with mitral valve repair and tricuspid annuloplasty. Her postoperative course was complicated by atrial fibrillation and new-onset type 2 diabetes mellitus. She was treated with albendazole and discharged in stable condition.
Conclusion: This report highlights a rare instance of isolated mitral valve echinococcosis, initially misdiagnosed as a myxoma. It underscores the importance of considering parasitic aetiologies in the differential diagnosis of intracardiac masses, particularly in patients with rural backgrounds.

KEYWORDS

Cardiac echinococcosis, hydatid cyst, mitral valve, intracardiac mass, parasitic infection

LEARNING POINTS

- Mitral valve involvement in cardiac echinococcosis is exceedingly rare and may clinically and radiographically mimic myxomas or vegetations.
- Hydatid disease should be considered in the differential diagnosis of intracardiac masses, especially in patients with epidemiologic exposure to livestock or dogs.
- Early recognition and surgical intervention, coupled with antiparasitic therapy, are essential for optimal outcomes in rare valvular hydatid disease.

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INTRODUCTION/BACKGROUND

Echinococcosis, or hydatid disease, is a parasitic infection caused by the larval stage of *Echinococcus granulosus*, transmitted through the faecal-oral route following contact with infected definitive hosts, typically dogs. It remains endemic in regions with extensive livestock farming, including parts of Eastern Europe, the Middle East, South America, and Central Asia[1].

The disease primarily affects the liver and lungs, while cardiac involvement is rare, occurring in approximately 0.5-2% of all infections. The mechanism of cardiac infection is believed to be hematogenous spread through the coronary circulation, typically affecting the myocardium[2]. Within the heart, the left ventricle is the most common site, followed by the right ventricle, atria, interventricular septum, and pericardium[3].

Cardiac hydatid cysts are often asymptomatic but can present with a variety of nonspecific symptoms such as dyspnoea, chest pain, palpitations, or systemic embolization. Echocardiography is the primary diagnostic tool, although imaging findings may mimic those of other intracardiac masses[4]. Valvular involvement, particularly of the mitral valve, is exceedingly uncommon and may mimic more common intracardiac pathologies such as myxomas or vegetations. Herein, we describe a rare case of isolated mitral valve hydatid cyst in a 74-year-old woman, initially misdiagnosed as a myxoma, highlighting the diagnostic challenges and clinical relevance of considering parasitic aetiologies in patients with relevant exposure.

CASE DESCRIPTION

A 74-year-old woman with a medical history of hypertension presented to the cardiology clinic with progressive exertional dyspnoea and generalized fatigue over the several weeks. She denied chest pain, orthopnoea, palpitations, or syncope. Review of systems was otherwise unremarkable. Residing in a rural region, the patient reported frequent interactions with animals, including dogs, pigs, cattle, and chickens. The patient also reported poor hygienic conditions. She denied smoking or alcohol use. Her current medications included losartan, amlodipine, cardioaspirin, and nebivolol.

On physical examination, she was afebrile, normotensive, and euvolemic. Cardiac auscultation revealed a harsh, crescendo-decrescendo systolic murmur best heard at the right upper sternal border radiating to the carotid arteries, consistent with aortic stenosis. Additionally, a low-pitched, mid-diastolic rumbling murmur was heard at the apex in the left lateral decubitus position, consistent with mitral stenosis, along with a high-pitched holosystolic murmur radiating to the axilla, indicative of mitral regurgitation. The intensity of the mitral murmurs varied with body position and throughout the cardiac cycle, reflecting dynamic obstruction and valvular incompetence caused by a mobile intracardiac mass intermittently prolapsing through the mitral valve. Vesicular breath sounds were heard on lung auscultation. The remainder of the physical examination was unremarkable.

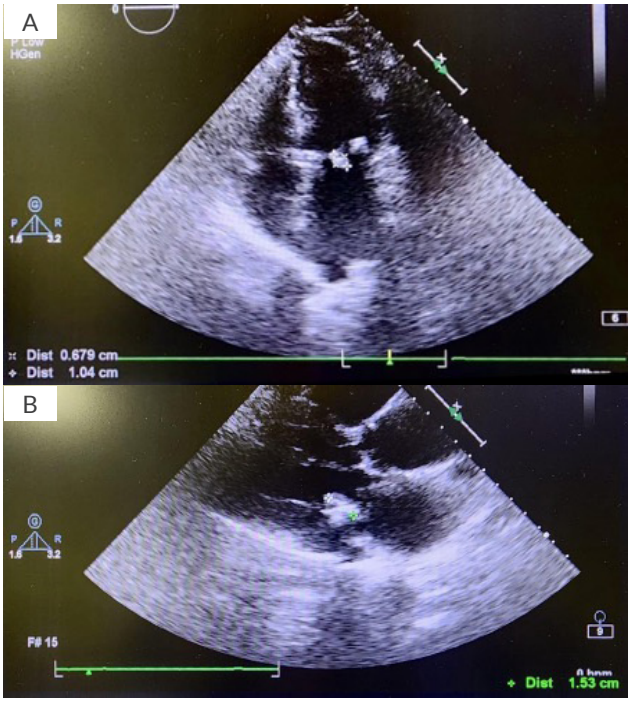


Figure 1. Transthoracic echocardiographic images demonstrating a mobile, hyperechoic intracardiac mass attached to the atrial side of the posterior mitral valve leaflet. A) Parasternal long axis view showing a mass measuring approximately 1.04 × 0.68 cm prolapsing into the left ventricle during diastole; B) Apical four-chamber view highlighting the same mass with a measured length of 1.53 cm.

Laboratory findings on admission revealed leukocytosis (white blood cell count: 16.8 $\times 10^9$/l; neutrophils: 89%), mild normocytic anaemia (haemoglobin: 10.8 g/dl), and a mildly elevated erythrocyte sedimentation rate (25 mm/hr). C-reactive protein and procalcitonin levels were within normal limits. Blood and urine cultures were negative.

Transthoracic echocardiography showed a normal left ventricular ejection fraction (55%) with impaired diastolic relaxation (Grade I diastolic dysfunction). A mobile, hyperechoic mass measuring approximately 1.5 × 1 cm was visualized on the atrial surface of the posterior leaflet of the mitral valve *(Fig. 1)*. The mass prolapsed into the left ventricle during diastole. Additional findings included mitral pseudo-stenosis (mean gradient: 4 mmHg), mild to moderate mitral regurgitation, and left atrial enlargement. Transoesophageal echocardiography confirmed these findings and raised suspicion for a myxoma or a vegetation. There was an atrial septal aneurysm, but no intracardiac shunt was observed. The aortic valve was fibrotic and slightly stenotic (AVA: 1.7 cm^2), accompanied by mild aortic and tricuspid regurgitation. Given the risk of embolization and the unclear aetiology of the mass, the patient was scheduled for surgical excision. Intraoperatively, a teardrop-shaped cystic mass was identified, attached to the P2 segment of the posterior mitral valve leaflet by a long, narrow pedicle. The mass contained approximately 12–15 daughter cysts, releasing a whitish, cottage cheese-like material upon dissection *(Fig. 2)*. The lesion was completely excised, and the P1-P2 gap was repaired using a double-row suture. Tricuspid valve



Figure 2. Gross specimen of the resected intracardiac mass. The mass was excised from the posterior leaflet of the mitral valve and displays a teardrop shape with multiple translucent, cyst-like vesicles and a pedunculated stalk. The appearance is consistent with a hydatid cyst containing daughter cysts, later confirmed histopathologically as Echinococcus granulosus.

annuloplasty was performed using De Vega's technique. Atrial septal reconstruction and right atrial closure were completed with continuous sutures.

Histopathological analysis of the resected mass demonstrated a calcified cyst wall featuring internal laminated structures and small daughter cysts, indicative of hydatid disease. Despite the absence of serologic or immunohistochemical testing, the morphological characteristics were diagnostic for cardiac echinococcosis.

The postoperative course was notable for several episodes of atrial fibrillation, which were successfully managed with chemical cardioversion. The patient also developed postoperative hyperglycaemia, with fasting glucose levels ranging from 131 to 166 mg/dl and random values exceeding 200 mg/dl. She was diagnosed with new-onset type 2 diabetes mellitus and managed initially with insulin, followed by diet modification. Glycaemic control was subsequently achieved without further pharmacologic intervention.

Follow-up echocardiography demonstrated normal function of the repaired mitral and tricuspid valves, normal ejection fraction, and minimal pericardial and pleural effusions. The patient was discharged in stable condition with cardiology and endocrinology follow-up.

DISCUSSION

Cardiac involvement in echinococcosis is exceptionally uncommon and often remains clinically silent for years. When symptomatic, it may lead to a range of manifestations, including arrhythmias, valvular insufficiency, systemic or pulmonary embolic events, and many other presentations, depending on the cyst's size and location within the heart[2]. When cardiac hydatid cysts do occur, the left ventricle is the most common site, due to its rich coronary blood supply and muscular bulk[3]. Involvement of valvular structures, particularly the mitral valve, is exceptionally uncommon, with only sporadic case reports documented in the literature[5].

The present report highlights a diagnostically and surgically challenging instance of isolated cardiac echinococcosis manifesting as a mobile mass on the posterior mitral valve leaflet. Our patient presented with nonspecific symptoms of dyspnoea and fatigue, typical of cardiac hydatid disease, which often has an insidious course and lacks pathognomonic clinical signs. The mass was initially interpreted as a potential myxoma based on transthoracic and transoesophageal echocardiography, consistent with prior reports in which cardiac hydatid cysts mimicked benign tumours, thrombi, or vegetations[4].

Cardiac hydatid cysts are typically well-circumscribed, cystic, and may contain daughter cysts or internal septations[6]. However, these classical features are not always evident on echocardiography. Moreover, echocardiographic limitations in differentiating hydatid cysts from more common intracardiac masses, especially in the absence of hepatic or pulmonary hydatid disease, can delay accurate diagnosis[6]. Advanced imaging, such as cardiac magnetic resonance imaging or computed tomography scan, can offer improved tissue characterization, but definitive diagnosis often rests on histopathological examination, as was the case here[7].

Surgical excision remains the treatment of choice for cardiac hydatid cysts due to the high risk of embolization, rupture, anaphylaxis, and hemodynamic compromise[2,3,7]. The surgical management of valve-involved cysts, however, poses unique technical difficulties. In our patient, the cyst was attached to the P2 segment of the posterior mitral leaflet. A conservative, valve-sparing approach was successfully employed using targeted cystectomy and segmental repair. Tricuspid annuloplasty was performed concurrently to address coexisting regurgitation. Intraoperative precautions to avoid spillage of cyst contents, such as field isolation and gentle manipulation, are critical to prevent recurrence and systemic dissemination[2].

Postoperative atrial fibrillation, as observed in our patient, is a well-documented complication of cardiac surgery, particularly in elderly individuals and in cases involving atrial manipulation[8]. In this setting, arrhythmia likely resulted from pericardial inflammation and atrial remodelling. The patient also developed new-onset hyperglycaemia postoperatively, ultimately diagnosed as type 2 diabetes mellitus. This may have been unmasked by perioperative stress and systemic corticosteroid exposure, a phenomenon increasingly recognized after major cardiac surgery[9].

There is still some debate about the role of adjuvant antiparasitic therapy with albendazole following surgical removal, though most guidelines recommend postoperative treatment to minimize recurrence risk[7,10]. Our patient was initiated on albendazole postoperatively as a precaution, with planned hepatic monitoring and outpatient follow-up. The World Health Organization endorses postoperative benzimidazole therapy for at least 1-3 months in such cases to reduce the risk of recurrence[10].

In conclusion, this case underscores the importance of considering echinococcosis in the differential diagnosis of intracardiac masses, particularly in patients with rural backgrounds or livestock exposure. Echocardiography remains essential for initial assessment, but diagnosis may ultimately rely on intraoperative and histological findings.

Prompt surgical intervention, combined with antiparasitic therapy and vigilant postoperative monitoring, offers the best chance for long-term recovery in such rare and potentially life-threatening presentations.

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