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Asian Cardiovascular and Thoracic Annals published online 12 November 2013

DOI: 10.1177/0218492313506125

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Hydatid cyst of the cardiac interventricular septum

Syed Nadir Naeem¹, Hira Burhan² and Ghufuranullah Khan¹

Abstract

Hydatid cysts of the cardiac interventricular septum are rare and present a diagnostic and therapeutic challenge. We report the case of a 48-year-old woman who was successfully treated with cyst excision and capitonnage.

Keywords

Albendazole, echinococcosis, echinococcus granulosus, heart diseases, ventricular septum

Introduction

Hydatid cysts of the cardiac interventricular septum are rare and present a diagnostic and therapeutic challenge. We report a case of a young woman who was successfully treated with cyst excision and capitonnage.

Case report

A 48-year-old woman from Afghanistan consulted our clinic because of shortness of breath and loss of appetite for 6 months. There was no previous history of note. Her general physical examination was unremarkable. She had normal vesicular breathing and normal heart sounds. Electrocardiography revealed nonspecific ST-segment changes in the anterior leads with left-axis deviation. A chest radiograph was normal, but an echocardiogram showed a cyst in the upper part of the interventricular septum, measuring 22 × 30 mm, with internal septations. Computed tomography showed a mass in the interventricular septum (Figure 1). The lungs and pulmonary vessels were normal. An angiogram revealed normal coronaries. Ultrasound of the liver was normal. An indirect hemagglutinin test for echinococcosis was negative. A diagnosis of hydatid cyst was made based on the radiological findings, and surgery was planned. The heart was approached through a median sternotomy, cardiopulmonary bypass was established, the aorta was crossclamped, and the heart was arrested with antegrade cold blood cardioplegia. Gauze soaked in 10% povidone-iodine solution was placed around the heart. The cyst was

accessed via a right ventriculotomy incision, aspirated, and then injected with 10% povidone-iodine solution. Ten minutes later, the cyst was opened (Figure 2). The germinal layer was removed with capitonnage of the residual cavity. The incision was closed with pledgetted mattress sutures. Weaning from bypass was uneventful. After routine closure, the patient was moved to the intensive care unit where she remained stable with no new electrocardiographic changes. She was discharged after one week on oral albendazole 400 mg twice daily to prevent recurrence. She was doing well at the 6-month follow-up. Histopathology confirmed a hydatid cyst. A postoperative echocardiogram revealed no gradient across the right ventricular outflow tract.

Discussion

The taeniid cestodes of the genus *Echinococcus* have 6 recognized species of which 4 cause human disease.¹ Humans are most frequently infected by *Echinococcus granulosus*. The adults lay eggs in the small bowel of the definitive host (commonly dog), which are passed in the feces. After ingestion by an intermediate host (sheep or goat), the egg releases an oncosphere that migrates via

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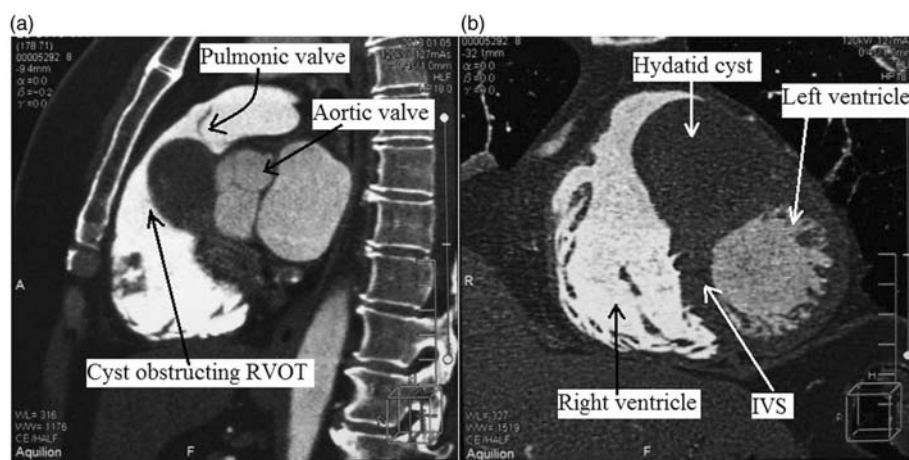


Figure 1. (a) Computed tomography showing the cyst projecting into the right ventricular outflow tract causing obstruction of the infundibulum. (b) The hydatid cyst in the superior segment of the interventricular septum measuring 4.2×4.2 cm. IVS: interventricular septum; RVOT: right ventricular outflow tract.

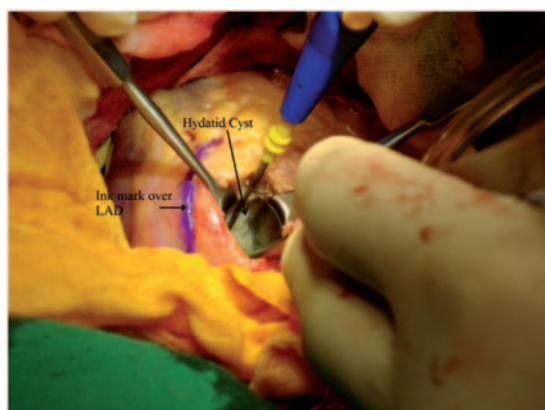


Figure 2. Operative picture (from patient's head) showing the hydatid cyst in situ. LAD: left anterior descending artery.

the circulation into various organs, especially the liver and lungs. The oncosphere develops into a cyst, producing protoscolices and daughter cysts that fill the cyst interior. The common rural practice of feeding sheep organs to dogs in turn facilitates transmission back to the dog. Humans become incidentally infected through contact with dogs via a fecal-oral route. Intermediary transmission of eggs by flies and arthropods may also result in infection of humans.¹ *Echinococcus granulosus* is prevalent in regions of Eurasia, South America and Africa.¹ In a study of 39,738 domestic livestock in Pakistan, 6.67% of animals were found to be infected. The prevalence of hydatid cysts was highest in camels (17.29%) followed by sheep (7.52%), buffalo (7.19%), goats (5.48%), and cattle (5.18%).²

Hydatid cysts occur most commonly in the liver (70%) and lungs (30%). Isolated cardiac hydatid cysts are rare, accounting for 0.02%–2% of all cases. The larvae reach the myocardium via the

coronary circulation. The most frequent area of involvement is the left ventricle (60%), presumably reflecting the dominance of the left coronary circulation. This is followed by the right ventricle (10%), pericardium (7%), pulmonary artery (6%), left atrial appendage (6%), and the interventricular septum (4%). Another route is by rupture of pulmonary cysts into the pulmonary vasculature.³

Patients have mostly nonspecific symptoms including vague chest pain, dyspnea, fatigue, and palpitation. With a pericardial hydatid cyst and a pericardial reaction, the pain can be severe.⁴ Specific symptoms reflect the location, size, number, and effect of the cysts.⁵ Left ventricular cysts are typically subepicardial and less likely to rupture. They may rupture causing pericardial tamponade, pericarditis, and pericardial seeding. With subendocardial cyst rupture, there may be anaphylaxis and death or systemic embolization leading to acute limb ischemia.⁶ Right ventricle cysts on the other hand are more prone to intracavitary rupture, and may lead to pulmonary embolization, pulmonary hypertension, and death.⁷ Cysts of the interventricular septum may present with outflow tract obstruction and conduction abnormalities. Serologic tests are of limited value in diagnosis. Enzyme-linked immunosorbent assay has sensitivity and specificity of 94% and 99%, respectively, and along with the indirect hemagglutinin test, it has proved to be the best test for follow-up. Transthoracic echocardiography is the investigation of choice. Computed tomography best shows wall calcification. Magnetic resonance imaging is the technique of choice for follow up. Specific signs of hydatid cyst include calcification of the cyst wall, the presence of daughter cysts, and membrane detachment.⁸

Early surgical removal is the treatment of choice. Off-pump resection of epicardial cysts is advocated by

some, but the majority use cardiopulmonary bypass regardless of the location. The principles of surgery are to avoid handling of the heart before crossclamping, and complete excision of the germinal layer. As for the residual cavity, some prefer to let it heal by secondary intent to avoid complications. However, this approach risks leaving a potential space behind, therefore, we obliterated the cavity with capitonnage which is the preferred method in the literature.⁵

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of interest statement

None declared.

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