The Heart Surgery Forum #2005-1131
9 (1), 2006 [Epub November 2005]
doi:10.1532/HSF98.20051131

Online address: http://cardenjennings.metapress.com/link.asp?id=112496

Complex Reconstruction of Hydatid Cyst–Destructed Left Ventricle: A Case Report

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ABSTRACT

Objective. Echinococcus cyst in the heart as a life threatening condition has a rare incidence of only 0.5% to 2%.

Material and Methods. We have described the case of a 23-year-old patient with an echinococcus cyst localized in the inferoseptal and posterior wall of the left ventricle. In a random x-ray examination, a pathological formation in the left ventricle was found in a completely asymptomatic patient. Using a transthoracic echocardiography, the existence of a multilocular echinococcus cyst in the left ventricle was confirmed. The cyst, with a diameter of 8 cm, was located at the distal third of the septum toward the posterior wall. The diagnosis was confirmed with transesophageal echocardiography, computerized tomography, and magnetic resonance imaging. We excluded the existence of other noncardiac localizations of the echinoccosis. The patient had normal angiography. After 3 and a half years of unsuccessful treatment with benzimidazole, the patient was enrolled for a surgical treatment. After a medial sternotomy, during extracorporeal circulation, we performed warm-blood cardioplegy and approached complete excision of the cyst. The multilocular cyst was opened at the apex. We punctured the cyst and aspirated the dense co-liquated cystic mass, instillating hypertonic solution for prevention of cyst dissemination. The pericystic sheath was resected down to an intact myocardium. The septal defect was closed with 2 circular sutures.

Results. The patient underwent the operation without any complications, and the patient's functions were stable following the intervention. Patient follow-up at 3 years showed no signs of relapse of the disease.

Conclusion. The surgical treatment is inevitable even when the location and approach technique are highly troublesome.

Received May 28, 2005; received in revised form September 28, 2005; accepted September 28, 2005.

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INTRODUCTION

A 23-year-old man presented with a remarkable deformation on the left cardiac silhouette on a routine chest x-ray. He worked as a farm technician in a rural area. History and physical examination revealed short-lived dyspnea during exercise. He was an active smoker and did not take any medications. The electrocardiogram revealed sinus rhythm and deep negative T waves in leads I, II, III, aVF, and V3-V6. Transthoracic echocardiography (TTE) demonstrated an enlarged left ventricle and the presence of a multilocular cystic mass (dimensions 7 × 8 cm) in the inferoseptal LV wall cuneiform progressing toward the posterior wall. The cyst did not have clear-cut edges and it locally invaded and annihilated the septum, protruding inside the left ventricular cavity. The transesophageal echocardiography (TEE) confirmed this finding (Figure 1).

The blood test determined a uric acid level of 7.7 mg%, upper limit bilirubins 1.1 mg%, and eosinophils of 0.13×10^9/L. The indirect hemagglutination test for E. granulosus was positive at 1:400. The coronarography and left ventriculography demonstrated unremarkable findings except for the contrast-filling defects at the tip of the left ventricle. Computed tomography (CT) and magnetic resonance imaging (MRI) (Figure 2) were used to obtain precise visualization and to eliminate the involvement of organs.

The decision for initial treatment was medicamentous with Albendazole (10 mg/kg) in 3 cycles of 14 days each, every cycle discontinued for 14 days. Due to signs of toxic hepatic injury, this regimen was abandoned. A control CT and ultrasound revealed further cystic expansion and serious flattening of the anterior cystic wall. Surgery was inevitable.

Through median sternotomy, a standard technique of cardiopulmonary bypass (CPB) with 32°C hypothermia and mild K^+/Mg^+ blood cardioplegic arrest was applied. Surgical findings included dense gelatinous pericardial adhesions on the apex and a huge saccular cyst with dimensions larger than those seen by CT or ultrasound (Figure 1). As a protective measure against spillage of the cyst content, the operative field was secured using compresses and sponges soaked in hypertonic (40%) glucose solution. The cyst was punctured at the very tip and all of its contents were carefully aspirated.

Instillation of hypertonic glucose solution followed. The apical incision was forwarded in the anterior and posterior

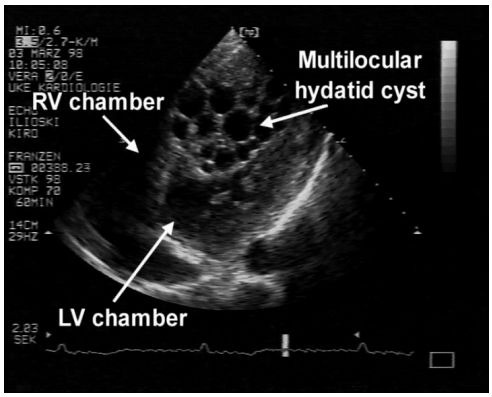

Figure 1. Multilocular character of the hydatid cyst as seen by TTE. The cystic mass is localized in the inferoseptal and apical part of the left ventricle, lacking clear demarcation lines.

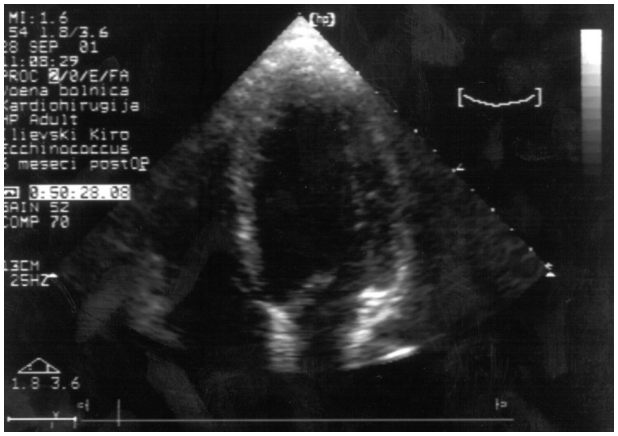

Figure 3. Unremarkable TTE findings at a 6-month follow-up.

directions until vital myocardium was encountered. The delicate cystic envelope was completely resected, creating a large circular defect in the left ventricle, which in cuneiform fashion was protruding in the septum (Figure 4).

The most profound parts of the defect were capitonnaged by two circular Prolene 1-0 sutures (Ethicon, Somerville, NJ, USA) placed 2 cm apart, thereby adapting the sides of the split septum. For complete reconstruction of the left ventricular geometry, simple interrupted Prolene 1-0 sutures were placed on the posterior wall, apex, and anterior wall. The remaining cavity was closed with a continuous over-and-over suture (Figure 5).

The pathohistologic report has confirmed the finding of a hydatid cyst. The postoperative period was unremarkable. The patient was dismissed after 6 days on a prophylactic dose of Albendazole 2×200 mg/d.

At a 6-month follow-up, the patient was asymptomatic with no echocardiographic evidence of recurrences (Figure 3). Three-year follow-up showed that the myocardium had excellent performances. The patient was in NYHA class I without any symptoms. At the time of this writing he was without any therapy. Immunologic tests for echinococcosis were negative, so he can be classified as cured.

COMMENTS

Cardiac hydatidosis is a very rare localization of this zoonosis, accounting for only 0.5%-2% of all locations even in endemic areas such as the Mediterranean coast, Africa, South America, Iceland, Australia, New Zealand, and the Middle East [De Paulis 1999]. With cardiac involvement, the most common locations of the cyst are the interventricular septum and the left ventricular free wall [Oliver 1988; Mechmeche 1983].

Patients with cardiac hydatidosis may present with diverse symptomatology, depending mainly on the size, number, and location of cysts. Clinical features include pericardial effusion, anaphylactic reactions, systemic or pulmonary embolism, systolic murmur, arrhythmias, and chest pain of pericardial or ischemic origin. Although hydatidosis does not intrinsically affect coronary vessels, deviation, bulging, kinking, and mechanical compression of the coronaries with nitroglycerin-responsive crisis of angina have been reported.

The first-choice imaging method for visualization and planning of surgery for cardiac hydatid cysts is ultrasonography, especially TEE, whereas the CT and MRI should be reserved for study of other organ involvement [Desnos 1987; Birincioglu 1999].

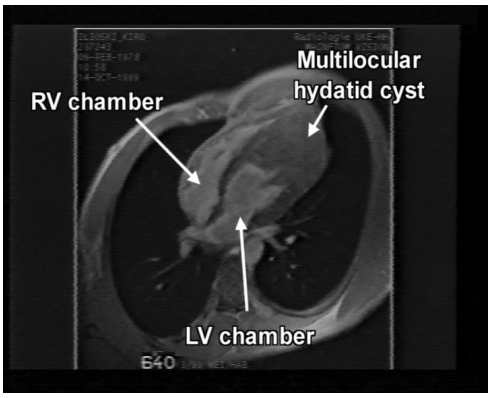

Figure 2. MRI: axial presentation of the relation of the mass with the ventricular septum.

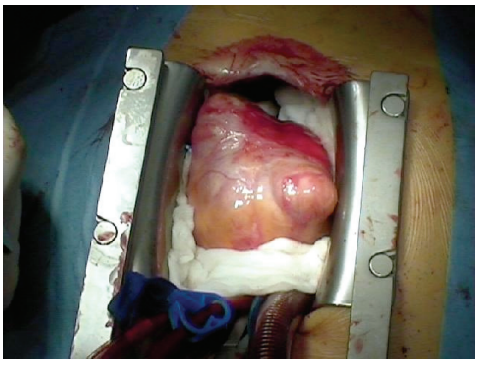

Figure 4. Exposure of the heart through median sternotomy and securing the operative field.

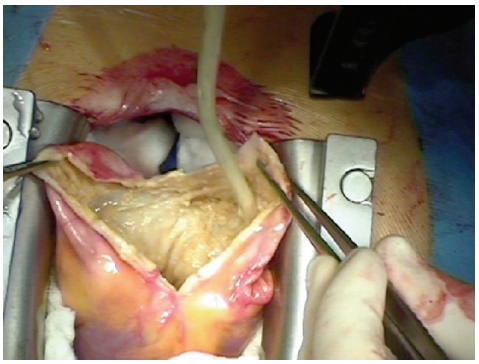

Figure 5. Incision and complete aspiration of cyst content.

With our patient, the diagnosis was initially made using echocardiography and serologic testing and was later confirmed by pathohistologic verification of the operative findings. Although the surgical treatment is the definite one for this pathology, it was initially abandoned with our patient due to technical difficulties (magnitude and location of the cyst, lack of clear demarcation) and high risk (intraoperative dissemination, anaphylactic shock) associated with it. Reports of patients successfully treated with Benzimidazoles have been published, yet this was not the case with our patient [Goskel 1991; Ozdemir 1997]. As follow-up was conducted, iatrogenic liver toxicity and further cyst growth were noted, challenging not only the question of continuing the conservative treatment, but also asking for reconsideration of the surgical treatment. The definite decision for operative treatment was based on CT and ultrasound findings that clearly demonstrated life-threatening cyst expansion and significant risk of rupture in the near future.

Different operative approaches have been reported. In a study of 9 patients operated on with standard CPB, Birincioglu and associates approached the cyst through left ventriculectomy in 6, aortotomy in 1, and right atriotomy in 1 [Birincioglu 1999]. In another patient with a hydatid cyst of the interventricular septum, Aupetit and coworkers approached the cyst through the right ventricle [Aupetit 1997]. We chose to open the cyst apically because we believed that that approach was the least damaging and threatening for the heart's function, in part enabling direct closure of the defect, as opposed to other experiences that had to employ closure with a Dacron patch [Tejada 2001].

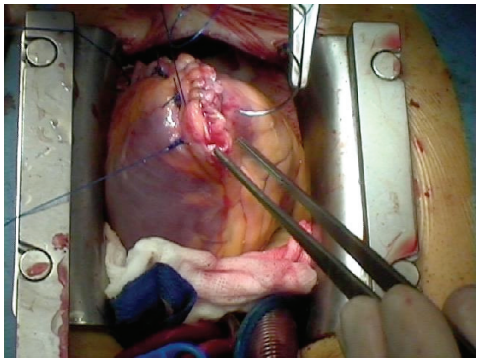

Figure 6. Definitive closure of the defect with continuous suture.

Because of the significant risk of cyst rupture, rapid and complete sterilization of the cyst content with instillation of hypertonic glucose or some other germicidal solution and complete extirpation of the lesion in a secured operative field are highly recommended.

Early postoperative findings were unremarkable. The patient was administrated prophylactic Albendazole treatment until significant titer withdrawal was noted.

Against a background of numerous dilemmas for surgical treatment and many controversial treatment approaches reported from several institutions, it seemed that the surgical treatment is inevitable even when the location and approach technique is highly troublesome.

REFERENCES

Aupetit JF, Ritz B, Ferrini M, Coppin M, Champsaur G. 1997. Hydatid cyst of the interventricular septum. Circulation 95:2325-6.

Birincioglu L, Bardakci H, Kucuker SA, et al. 1999. A clinical dilemma: cardiac and pericardiac echinococcosis. Ann Thorac Surg 68:1290-9.

Capella G, Zolezzi F, Villani R, et al. 1986. Right cardiac echinococcosis with coronary compression. Description of a clinical case [in Italian]. G Ital Cardiol 16:696-701.

De Paulis R, Seddio F, Colagrande L, Polisca P, Chiariello L. 1999. Cardiac echinococcosis causing coronary artery disease. Ann Thorac Surg 67:1791-3.

Desnos M, Brochet E, Cristofini P, et al. 1987. Polyvisceral echinococcosis with cardiac involvement imaged by two dimensional echocardiography, computed tomography and magnetic resonance imaging. Am J Cardiol 59:383-4.

Goksel S, Kural T, Ergin A, et al. 1991. Hydatid cyst of the interventricular septum. Diagnosis by cross-sectional echocardiography and computed tomography, treatment of mebendazole. Jpn Heart J 32:741-4.

Mechmeche R, Bousnina A, Ismail B. 1983. Use of coronary angiography in the diagnosis of hydatid cysts of the heart [in French]. Arch Mal Coeur Vaiss 76:305-12.

Oliver JM, Sotillo JF, Dominquez FJ, et al. 1988. Two-dimensional echocardiographyc features of echinococosis of the heart and great blood vessels. Circulation 78:327-37.

Ozdemir M, Diker E, Aydosdu S, et al. 1997. Complete heart block caused by cardiac echinococcosis and successful treatment with albendazole. Heart 77:84-5.

Tejada JG, Saaverda J, Molina L, et al. 2001. Hydatid disease of the interventricular septum causing pericardial effusion. Ann Thorac Surg 71:2034-5.