Acute Abdominal Aorta Embolism Caused by Rupture of a Cardiac Hydatid Cyst

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We report a case of an abdominal aortic embolism due to rupture of a cardiac hydatid cyst. This report emphasizes the diagnostic, preventative, and treatment options for hydatid cyst embolism of abdominal aorta. Echocardiography should be routinely performed in all patients with hydatid disease for possible involvement of the heart. This enables early diagnosis and treatment of cardiac echinococcus before life-threatening complications occur.

Patients with cardiac echinoccocosis may remain asymptomatic for many years or have minor nonspecific complaints, but it is associated with an increased risk of lethal complications if left undiagnosed and untreated.[1] Embolism of the abdominal aorta by an echinococcus cyst is extremely rare and is usually due to rupture of an intracardiac hydatid cyst. This case emphasizes the need for evaluation to detect hydatid cyst involvement of the heart in patients with hydatid disease.

CASE REPORT

A 14-year-old boy was admitted to our hospital with symptoms of acute onset of lower extremity ischemia, fever, and cerebral confusion. His past medical history showed surgical excision of a right lung hydatid cyst 2 weeks previously at another hospital. He had been on a regimen of oral mebendazole for 2 weeks.

On admission, the patient was dyspneic and confused. On physical examination he had a blood pressure of 70/30 mmHg with a heart rate of 130 beats/min and temperature of 40°C. Bilateral femoral and distal arterial pulses were absent. Cardiac and abdominal examination, and electrocardiography results were normal except sinus tachycardia. Laboratory tests yielded an increased leukocyte count of 9000/mm^3 with 10% eosinophils and a sedimentation rate of 60 mm/hr.

Color flow duplex scanning showed complete obstruction of blood flow at the level of aortic bifurcation. A sphere-shaped residual cyst cavity in the posterolateral wall of the left ventricle (LV) was detected on two-dimensional transthoracic echocardiography (Fig. 1A). Digital subtraction angiography revealed total occlusion of the abdominal aorta by a smooth-surfaced, spherical or dome-shaped mass just above the iliac bifurcation (Fig. 1B). Cranial, thoracic, and abdominal computed tomography (CT) and abdominal ultrasound were performed for possible infiltration of other parts of the body. There was no evidence of any other cyst.

On the basis of the results of all imaging modalities, the diagnosis of acute aortic embolism due to cardiac hydatid cyst rupture was established. The patient underwent emergency surgery for acute aortic hydatid cyst embolization. The aortic wall was so thin that the slightly bulging yellowish mass was remarkable at the anterior wall of the abdominal aorta. After circumferential control of the infrarenal abdominal aorta and iliac arteries, a longitudinal aortotomy just above the bulging aortic wall was performed. A large cyst protruded spontaneously from the aorta (Fig. 2A). The cyst contained a dull, yellowish-white membrane with a small tear and was filled with blood (Fig. 2B). After removing the cyst, small pieces of thrombus were withdrawn from iliac arteries and quite good backflow (retograde flow through collateral circulation coming from the femoral artery) was obtained. The aorta was irrigated with saline solution and the aortotomy was closed with running 4.0 polypropylene suture.

The patient's postoperative course was uneventful. The pathology report of the removed cyst wall described a chitinous membrane and germinative membrane, which demonstrated the hidatid nature of the cyst. The hydatid cyst hemagglutination test was positive. He was discharged on a standard regimen of oral albendazole

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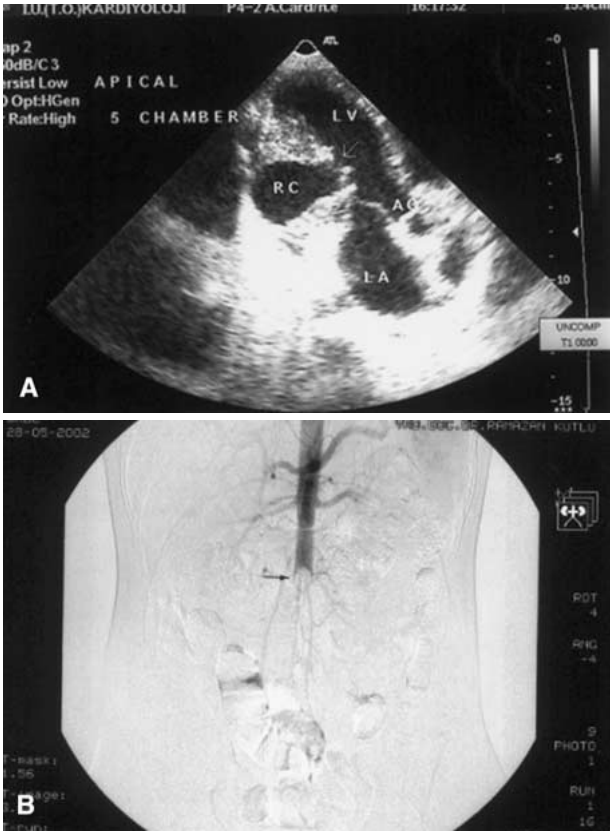

Fig. 1. A Transthoracic echocardiographic view showing the residual cyst cavity (*RC*) of hydatid cyst at the posterolateral wall of the left ventricle. The *white arrow* shows the rupture orifice. *LA*, left atrial cavity; *LV*, left ventricular cavity; *AO*, aortic valve. **B** Digital subtraction angiogram showing total occlusion of abdominal aorta just above the iliac bifurcation. The *black arrow* shows the cyst.

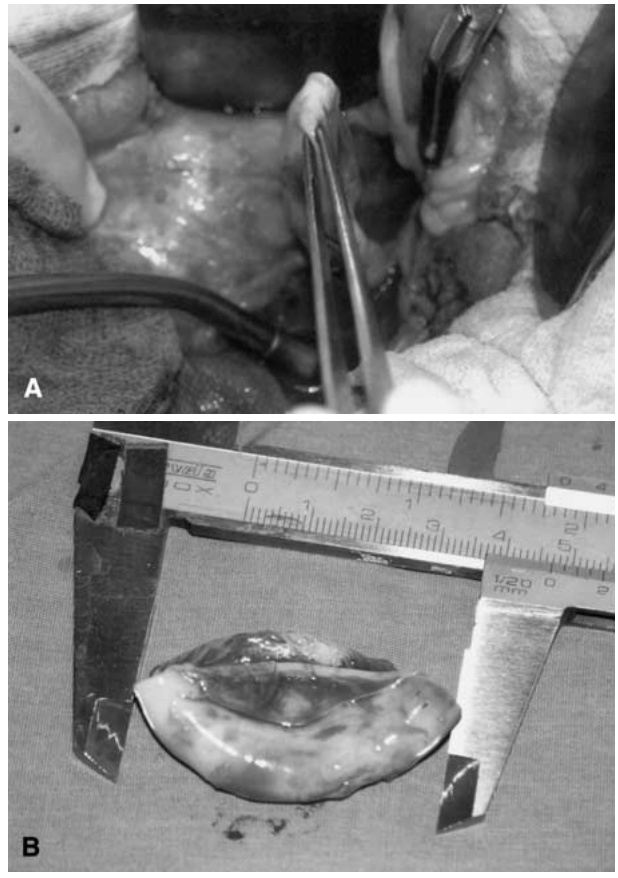

Fig. 2. A Intraoperative photograph showing the cyst protruding from the aorta after aortotomy. **B** Gross appearance of the ruptured cardiac hydatid cyst that caused abdominal aorta embolism.

therapy for 3 months, as prophylaxis against cyst recurrence. The patient has undergone close follow-up every 3 months, and after 12 months he has remained free of ischemic symptoms. Transthoracic echocardiography showed no further cyst formation and no dimensional changes of the residual cyst cavity in the LV wall.

DISCUSSION

Cardiac involvement of hydatid disease is uncommon and comprises only 0.5-2% of all hydatidosis cases.[1] Half of the patients with cardiac echinococcosis have a prior history of hydatid disease involving other organs.[2] Cardiac hydatid cysts may stay asymptomatic for a long time and their diagnosis is difficult. The clinical presentation is variable and according to localization, the disease may present with forms mimicking coronary artery disease, valvular heart disease, pericarditis, and conduction abnormalities; however, rupture of cardiac hydatid cysts may induce systemic or pulmonary embolization or an anaphylactic reaction.

In our case report, a medical history of previous hydatid cyst surgery and mebendazole treatment, acute onset of lower extremity ischemia, and absence of lower extremity pulses led us to suspect an acute abdominal aorta embolism due to rupture of a undiagnosed cardiac hydatid cyst. The patient had not been evaluated for cardiac hydatid disease before he underwent pulmonary hydatid cyst surgery. Although he had no cardiac symptoms, we immediately performed echocardiography to identify the source of emboli, whether the abdominal aorta was occluded by a migrated cyst or blood clot. Echocardiography clearly showed the ruture orifice and residual cyst cavity (Fig. 1A). These findings were the most important evidence that confirmed our suspicion of rupture of a cardiac cyst. Two-dimensional echocardiography is a useful and

adequate technique for the diagnosis and management of cardiac cysts.[3]

The definitive treatment of cardiac hydatid cysts is surgical extraction of the cyst.[2] The use of cardiopulmonary bypass (CPB) techniques is the surgical approach of choice when cysts are in the cardiac chambers. If there is no connection between the cyst cavity and cardiac chambers, cysts can be easily removed without CPB. Cardiac cysts can be directly removed from the cardiac wall or, following polyvinylpyridine iodine injection into the cyst and aspiration of the cyst, the germinative membrane can be removed.[2] Removal of the cyst with the germinative membrane is the optimal surgical treatment. Although cardiac hydatid cysts are generally treated surgically, treatment with antiparasitic drugs such as albendazole or mebendazole may provide complete recovery from the illness.[4] However, the choice of medical treatment does not prevent emergence of serious complications.

Rupture into cardiac chambers may be spontaneous or due to death of a cyst. In our case, previous medical treatment with albendazole may have caused a reduction in cardiac cyst size or death of the cyst which subsequently resulted in rupture of the hydatid cyst. Monthly echocardiography was performed to detect new hydatid cyst formation and to follow up the course of the residual cavity in the heart. There was no new cyst formation or dimensional changes of the residual cavity.

Arterial involvement of a hydatid cyst usually develops after cardiac hydatid cyst rupture and embolism of the germinative membrane with acute clinical presentation. Surgical treatment of this complication is complete removal of the cyst from the vascular lumen. Intravascular growth of a hydatid cyst is a rare manifestation of disease and usually causes chronic arterial occlusion. The acute, abrupt occlusion of the aorta in our case was caused by spontaneous rupture of the cardiac cyst. We performed digital subtraction angiography to confirm the diagnosis, to determine the level of occlusion, and to plan the surgical approach. It demonstrated total occlusion of the abdominal aorta just above the iliac bifurcation by a smooth-surfaced, spherical or dome-shaped mass that revealed a cyst (Fig. 1B). Cranial, thoracic, and abdominal CT and abdominal ultrasound were also performed before the operation for possible involvement of other parts of the body. To our knowledge, removal of the cyst from the aorta and thrombus from the iliac artery is the appropriate surgical treatment. In the case of primary arterial involvement, removal of affected arterial segments and reconstruction of blood flow with bypass grafting are needed.[5,6]

In conclusion, before treatment of noncardiac hydatid cyst disease, all patients should be evaluated for possible involvement of other parts, particularly for cardiac involvement. The awareness and suspicion of cardiac hydatidosis will facilitate its diagnosis and early treatment, thus preventing life-threatening complications. Early diagnosis of and surgical intervention for these complications, particularly in the acute form of aortic embolization, could be life saving.

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