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Complete Atrioventricular Block due to a Hydatid Cyst Located in the Interventricular Septum: A Case Report

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ABSTRACT

We report a case of complete atrioventricular block and tricuspid valve insufficiency due to a cardiac hydatid cyst located in the interventricular septum that occurred in a 19-year-old male patient. Surgery was carried out with the help of cardiopulmonary bypass. The cyst was excised, and the interventricular septum was closed with an autologous pericardial patch treated with glutaraldehyde. The tricuspid valve insufficiency was repaired with annuloplasty. A dual-chamber epicardial pacemaker was implanted. The postoperative course was uneventful, and the patient was doing well 6 months after discharge.

This is the first report of a cardiac hydatidosis case for which the repair of the interventicular septum, tricuspid annulopasty, and permanent pacemaker implantation were performed during the same operation.

INTRODUCTION

Cardiac echinococcosis is a rare parasitic disease, and septal involvement with a hydatid cyst is a rare pathology. Complete atrioventricular (AV) block due to interventricularly located hydatid cyst is reported very rarely [Tajeda 2001]. We report the surgical treatment of a patient with a hydatid cyst located in the interventricular septum and causing complete AV block and tricuspid valve insufficiency.

CASE REPORT

A 19-year-old man with a history of dyspnea on exertion presented with worsening of symptoms and syncope. On physical examination, his blood pressure was 90/50 mmHg and pulse rate was 40 beats/min. There was a prominent grade 3/6 holosystolic murmur at the left sternal edge. Abdominal examination was normal. The electrocardiogram showed a complete AV block. Laboratory tests were normal. A chest x-ray showed cardiomegaly with moderate pulmonary congestion. Transthoracic echocardiography showed a cystic mass (3 × 4 cm) in the interventricular septum (Figure 1). The left ventricular systolic and diastolic diameters were enlarged (52-72 mm) and grade 3 tricuspid valve regurgitation was present. The indirect hemagglutination test for hydatidosis was negative. Abdominal ultrasonography was normal. Thoracoabdominal computed tomography confirmed the presence of a single mass at the basal membranous interventricular septum (Figure 2). The patient was scheduled for urgent surgery.

Operative Technique

Surgery was performed by standard median sternotomy. Cardiopulmonary bypass (CPB) was instituted using bicaval and ascending aortic cannulation. Moderate systemic hypothermia (29°C) was induced and antegrade cardioplegia was brought about for myocardial protection. The right atrium was then opened. An oval-shaped mass (4 cm in diameter) was found at the interventricular septum (Figure 3). The area surrounding the cyst was packed with pads soaked with 30% dextrose in water. To prevent contamination of the surrounding area, first the cystic fluid was aspirated, then 30% dextrose in water was injected into the cyst to sterilize the cyst scolices. The cyst capsule was incised, and the germinal membrane enucleated from the cyst cavity 5 minutes after injecting the sterilizing solution. The capsule was excised, and the interventricular septum was closed with a glutaraldehyde-treated autologous pericardial patch (Figures 4 and 5). Single sutures were used across the tricuspid annulus for the upper portion of the patch, and a running suture for the lower part. The tricuspid valve was repaired using the De Vega annuloplasty technique. Following aortic declamping, the patient was in complete AV block. A dual-chamber epicardial permanent pacemaker (Kappa DR 901; Medtronic, Minneapolis, MN, USA) was implanted and started to work in DDD mode. After closure of the right atrium, the patient was weaned off the CPB in pace rhythm.

Postoperative Course and Follow-up

The patient had a fairly uncomplicated postoperative period, and was discharged in good condition. Histopathological analysis of the surgical specimen confirmed the diagnosis of a hydatid cyst. Prophylactic medical therapy (albendazole) was started postoperatively. Six months later, the patient was asymptomatic and without evidence of recurrence. Computed tomography scans of the chest and abdomen were normal. Post-

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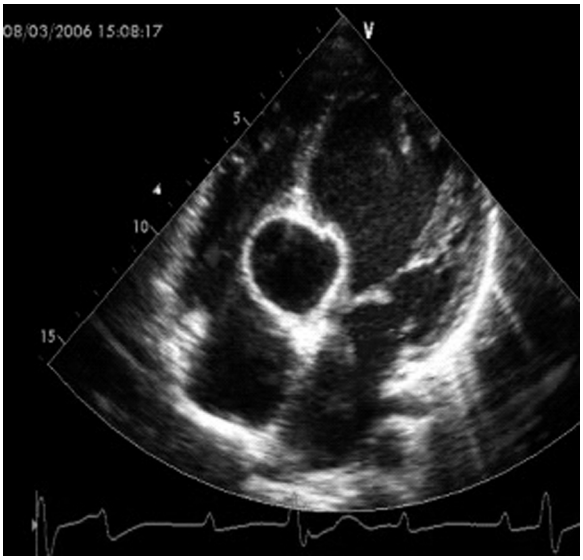

Figure 1. Transthoracic echocardiography shows a cyst located in the interventricular septum that protrudes into both cavities. An electrocardiograph shows a complete heart block.

operative control transthoracic echocardiography showed minimal (grade 1) tricuspid valve regurgitation and there was no residual ventricular septal defect or cystic formation.

DISCUSSION

Cardiac echinococcosis can lead to a variety of different cardiac manifestations depending on the location of the cyst, including valvular dysfunction, conduction block, cardiac tamponade, and outflow tract obstruction [Birincioglu 1999; Kurtoglu 2000; Maffeis 2000] Early recognition and treatment of cardiac echinococcosis is important because the risk of cyst rupture is high and may result in potentially lethal complications such as embolization and anaphylactic reactions.

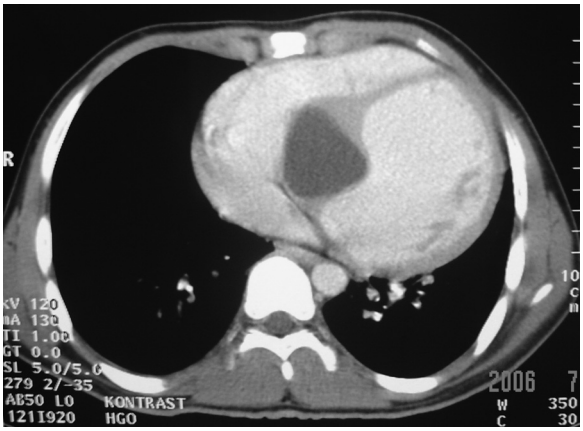

Figure 2. Appearance of the hydatid cyst on a computed tomography scan.

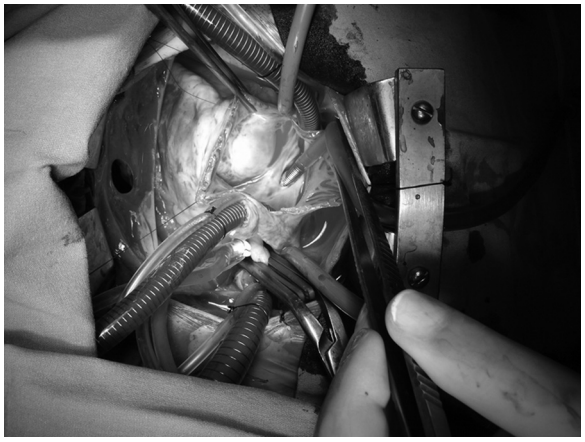

Figure 3. Operative view of the cystic mass following right atriotomy.

In this case, and in a previously published case [Yilmaz 1995], the indirect hemagglutination test for hydatidosis was negative in the preoperative period. Indirect hemagglutination and enzyme-linked immunosorbent assay tests are sensitive in hepatic cases (85%-98%), but are less sensitive for lung involvement (50%-56%), and have poor sensitivity for involvement of other organs (25%-56%) [Force 1992]. Although serologic tests are commonly used, echocardiography is more sensitive than serology when isolated cardiac echinococcosis is suspected. Transthoracic and transesophageal echocardiography, computed tomography, or magnetic resonance imaging are diagnostic tools widely used for cardiac cyst hydatidosis.

Although there are reported cases of cysts disappearing with albendazole therapy [Birincioglu 1999; Keles 2000], surgical excision is the treatment of choice to prevent further potentially fatal complications. Preoperative and postoperative albendazole therapy should also be applied to avoid recurrence. In this case, because of the urgency of the patient's condition, we did not administer perioperative albendazole treatment until immediately after surgery.

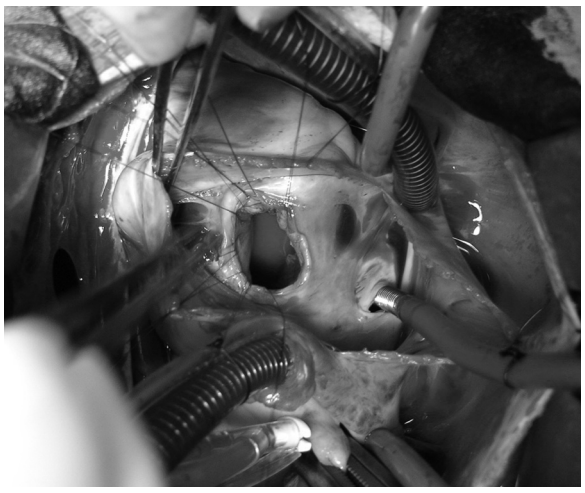

Figure 4. Operative view of the ventricular septal defect.

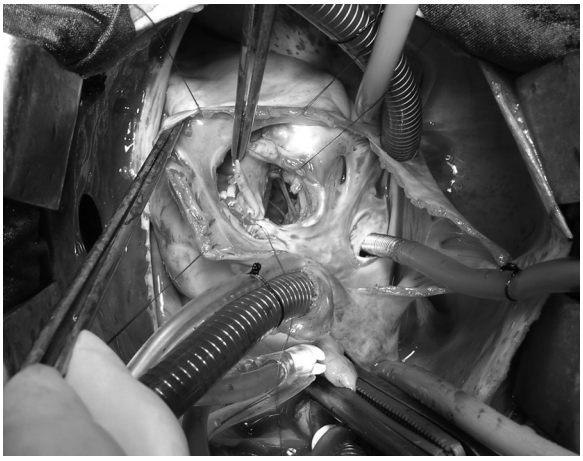

Figure 5. Intraoperative view of the interventricular septum closure using a gluteraldehyde-treated pericardial patch.

Gentle cannulation for establishing CPB, avoidance of excessive manipulation of the heart during surgery, and the use of a cross clamp on the aorta help reduce the risk of systemic embolism. We used cardioplegic arrest and an aortic cross clamp in our patient. To prevent pulmonary embolization, the pulmonary artery may be clamped in right-sided or intercavitary lesions when necessary. Also, right atriotomy obtains good exposure and reduces the risk of the cyst rupturing in such patients.

With regard to the conduction tissue and the relatively frequent AV blocks that occur when the cyst is situated on the interventricular septum, some authors have reported reversible AV block with restoration of a normal AV conduction after surgical removal of the septal cyst [Ottino 1987]. Thameur et al [2001] inserted a permanent pacemaker (probably endocardial) in 2 patients who had complete AV block that persisted after cystectomy. Mecozzi et al [2003] reported a similar case that required a permanent pacemaker (endocardial) implantation before discharge.

If the patient has complete AV block (preoperative and after releasing the cross clamp) together with a large hydatid cyst at the interventricular septum, insertion (endocardial) or implantation (epicardial) of a permanent pacemaker should be considered. This is the first report of a cardiac hydatidosis case for which the repair of the interventicular septum, tricuspid annulopasty, and permanent epicardial pacemaker implantation were performed during the same operation.

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