

Surgical removal of a cardiac hydatid cyst in the interventricular septum causing complete atrioventricular block

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ABSTRACT

Hydatid cysts are caused by the larva of *Echinococcus* which is usually seen in the lungs and liver. It is uncommon in the heart and rarely seen in the interventricular septum. Cardiac hydatid cysts are often asymptomatic; however, they sometimes may cause impaired cardiac conduction system and syncope. Herein, we report a 20-year-old female case with a cardiac hydatid cyst nested in the interventricular septum causing complete atrioventricular block.

Keywords: Atrioventricular block; cardiac hydatid cyst; echinococcosis, hydatidosis.

Hydatid cysts are parasitic diseases caused by the larva of *Echinococcus*.^[1] It usually located in the liver and lungs and cardiac involvement is extremely rare, accounting for 0.5 to 2% of the cases.^[2] The left ventricle wall is the most common involvement site; however, hydatid cysts can be found in the heart as well.^[3] Also, it may be less frequently seen in the pericardium, right ventricle, and interventricular septum. Herein, we report a 20-year-old female case with a cardiac hydatid cyst nested in the interventricular septum causing complete atrioventricular (AV) block.

CASE REPORT

A 20-year-old female patient was admitted to our Cardiology outpatient clinic with complaints of malaise and dizziness. She had no previous hydatid disease history. Atrioventricular block was found in the electrocardiography. There were no abnormal findings in her physical examination. On transesophageal (TEE) and transthoracic echocardiography (TTE), a 2x2.4 cm cystic mass was detected in the interventricular septum. As the hydatid cystic disease is endemic in Turkey, the patient was referred to our clinic for surgical treatment with the initial diagnosis of cardiac hydatid cyst. The mass was measured as 2.5x2.8 cm using the thoracic computed tomography (CT) (Figure 1). Serological test results for *Echinococcus* infestation were negative. Complete blood count showed mild eosinophilia without any other abnormal findings.

The patient was scheduled for surgery. A written informed consent was obtained from the patient.

Under general anesthesia and proper monitorization, a median sternotomy was performed. Following the aortic and bicaval venous cannulations, cardiopulmonary bypass (CPB) was established. The aorta was cross-clamped and the heart was arrested with antegrade cardioplegic solution. A right ventriculotomy was done adjacent to the interventricular septum. The hydatid cyst was exposed (Figure 2). Approximately 5 mL of turbid fluid was aspirated with a syringe from the cyst and, then, it was filled with 3% sodium chloride solution. After five minutes of exposure to the hypertonic solution, the cyst was re-emptied. The cystic material was totally removed through cystotomy and the remaining cavity was closed with 3/0 polypropylene sutures. No ventricular septal defect was detected. The right ventriculotomy was closed with primary suturing using the Teflon felt strips and no patch was used for the closure. An epicardial pacemaker was implanted during the operation due to the complete AV block. Samples of the cystic fluid and the cystic material were sent for pathological and histological examination. The patient was transferred to the

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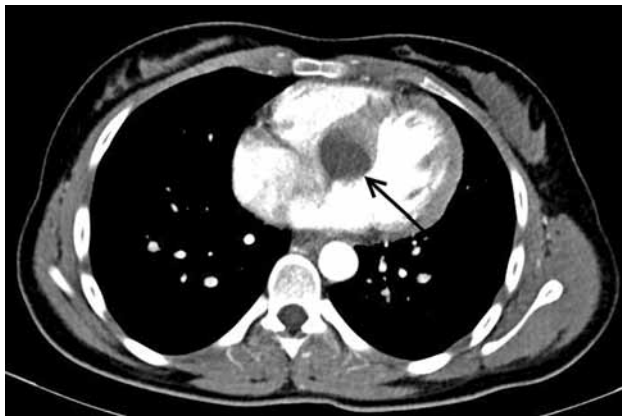


Figure 1. Thoracic computed tomography of the cyst in the interventricular septum (arrow).

Cardiology clinic in the seventh postoperative day for permanent pacemaker implantation. We administered oral albendazole therapy in the postoperative period and the patient was discharged with oral albendazole prescription.

DISCUSSION

The main cause of hydatid cysts in human is *Echinococcus granulosus* and human is the intermediate host in its life cycle.^[4] Most of its embryos can be eliminated by the host immune system; however, they sometimes can survive and evolve to the cystic state.^[5] The cysts usually grow very slowly (1 cm/year).^[5] The larvae can reach the heart via the coronary circulation; however, cardiac hydatid cysts are uncommon due to the contraction ability of the heart (0.5 to 2% of the cases).^[6] An adventitial pericystic layer was formed around the cyst, when it is placed in the myocardium as a reaction against it.

In addition, these cysts may cause several symptoms according to the location. Most of the cardiac hydatid cysts are asymptomatic. Most common clinical manifestations are precordial chest pain and coughing. Also fever, hemoptysis, arrhythmia, and cardiac conduction disorders, dyspnea, syncope, acute myocardial infarction, valvular disorders, pericarditis can be seen. A ruptured cardiac hydatid cyst may also cause more serious complications such as pericardial tamponade, pulmonary or systemic embolization, pulmonary hypertension, and anaphylactic reactions.^[2] Ulgen et al.^[7] reported a case who died from recurrent cerebral embolization of a ruptured cardiac hydatid cyst. In our case, the patient had malaise, dizziness, and

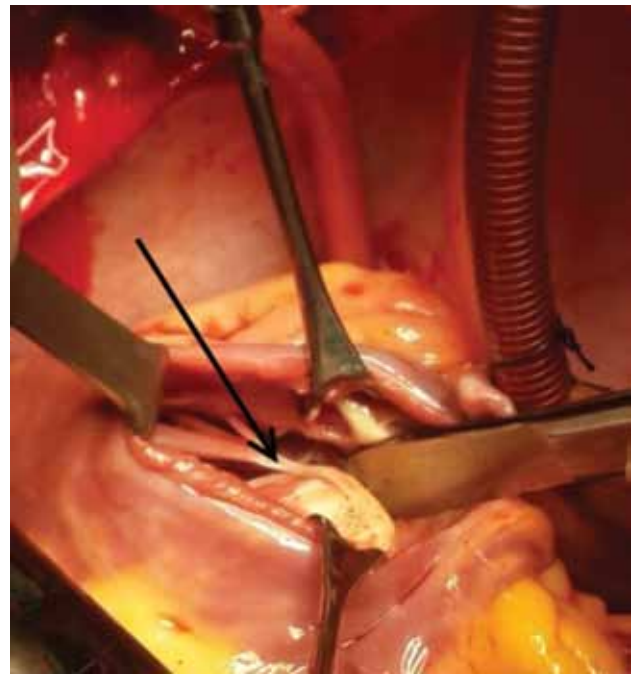


Figure 2. The cyst was exposed by right ventriculotomy (arrow).

complete AV block probably due to the mass effect of the cyst and compression of the conduction pathway of the heart. A similar case reported by Ipek et al.^[8] with a cardiac hydatid cyst located in the interventricular septum which was revealed by a complete heart block which was removed under CPB. In our case, the AV block did not recover and, therefore, a permanent pacemaker was implanted postoperatively.

The diagnosis of cardiac echinococcosis is mainly based on the combination of clinical suspicion, cardiac imaging, and serological tests. Echocardiography is the most common method for the diagnosis of cardiac hydatid cyst. Also, CT imaging can be used in the differential diagnosis and can determine the size and exact location of the cyst in the heart. Serological test results for echinococcosis were negative in our case; however, histological and pathological examinations of the intraoperative specimens confirmed the diagnosis of a hydatid cyst.

The most favored method for the treatment of cardiac hydatid cysts is surgical treatment under CPB. The cyst content should be removed carefully and it should be sterilized with hypertonic saline solution to prevent recurrence. It has been reported that nearly 10% of all hydatid cysts tend to recur

after surgery.^[9] Albendazole alone or in combination with praziquantel can be used as prophylaxis. We also administered oral albendazole therapy in the postoperative period and the patient was discharged with albendazole prescription.

In conclusion, cardiac hydatid cysts may cause serious complications, such as anaphylactic reactions and sudden death in case of ruptures, particularly. It can easily be diagnosed with transthoracic echocardiography. The surgical treatment yields favorable results. Therefore, we recommend the surgical treatment of this pathology as soon as possible.

Declaration of conflicting interests

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