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## Cardiac cystic echinococcosis: Report of three cases

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### ABSTRACT

We present a retrospective analysis of three cases of cardiac hydatidosis, who underwent surgery between 2010 and 2012. Two patients had a lesion in the interventricular septum, whereas one patient had the lesion in apicoinferior wall of LV. The diagnosis was made by echocardiography, but magnetic resonance imaging was utilized to assess cyst activity and extend of disease. All patients were placed on cardiopulmonary bypass. No postoperative complication or death occurred. The patients discharged uneventfully and all of them were free from hydatid disease at two years follow-up. We concluded that cardiac hydatid cysts should be removed surgically regardless of their location or extent, even in asymptomatic patients.

## 1. Introduction

Cardiac hydatidosis is rare, accounting for 0.5% to 2.0% of all hydatid infestations[1] and can occur as part of a widespread systemic infection or as an isolated event. It remains endemic in developed and developing countries and generally occurs in rural areas. The incidence of hydatid disease in Turkey has been reported as 3.4 cases in 100 people[2]. The most common locations of cardiac hydatid cysts were left ventricle (LV), interventricular septum and right ventricle, respectively. It may remain asymptomatic for a remarkably long period of time. It is usually detected accidentally because there is no specific clinical picture of disease. Initial diagnosis was made on echocardiography; then, both computed tomography (CT) and magnetic resonance imaging (MRI) can be used for further identification. We reported three cases of cardiac

hydatid disease, in which one patient had a lesion in the interventricular septum and the other in apicoinferior wall of LV.

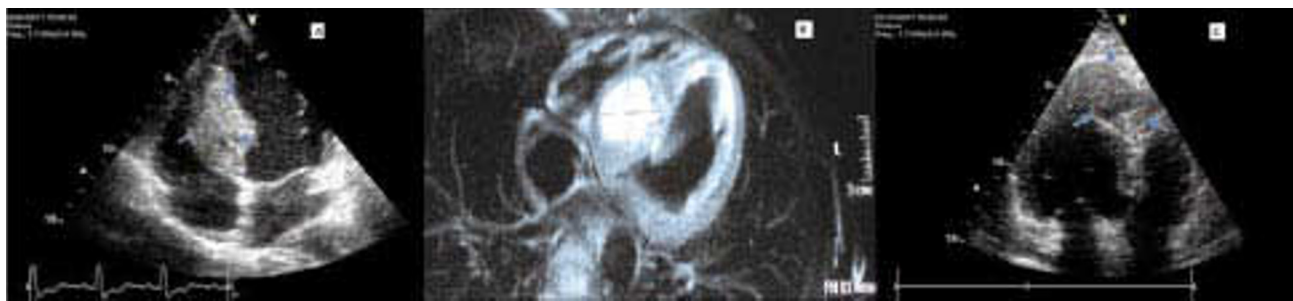
## 2. Case report

Between 2010 and 2012, three patients with cardiac hydatid disease underwent surgical treatment in our clinic. All patients were male, and their ages ranged from 24 to 44 years (mean, 38 years). The patient 1 and 3 had undergone previous conservative surgery for hydatid liver cyst in 1996 and 2009, respectively. In addition, the patient 3 was hospitalized for medical treatment of pulmonary hydatid disease 1 year ago. The symptoms were shortness of breath and fatigue in the patient 1 and 3; intermittent atypical chest pain, mimicking acute myocardial infarction, in the patient 2. An electrocardiography revealed non-specific T wave changes in the inferior leads in the patient 2, whereas physical examination was unremarkable with a normal sinus rhythm for other patients. In all of the cases, cardiac

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hydatid disease was diagnosed by echocardiography and confirmed upon MRI for further characterization of the lesion in the patient 1 and 2. Cardiac hydatid disease was found in the intact ventricular septum in the patient 1 and in LV in the patient 2 (Figure 1). The hydatid cysts on MRI had a fluid content with a homogeneously hypointense signal intensity on T1-weighted images and a homogeneously hyperintense signal on T2-weighted images and were seen as multiloculated lesions with regular borders (Figure 1). Ultrasound evaluation of the abdominal organs revealed a 2.5 cm × 2.2 cm solid, stage 4 cyst in upper pole of spleen in the patient 1. Indirect hemagglutination titers for echinococcus antibodies were positive in all patients. The clinical data of the patients are shown in Table 1. The surgical approach was the same in all patients. They underwent elective operation through median sternotomy, and cardiopulmonary bypass was initiated using aortic arterial and bicaval venous cannulation. The two layers of sponges were placed adjacent to the myocardial incision in order to prevent dissemination of the parasites into mediastinal cavity. Of the three patients with ventricular subepicardial wall involvement, the patient 1 and 3 had a cyst in the interventricular septum and the patient 2 had

a cyst at intramyocardial LV, close to inferoapical part of septum. The mass was first punctured without opening adjacent cardiac chambers; aspiration and sterilization of the entire cyst was performed respectively. The remaining cyst contents and germinative membrane were removed, and then the pericystic cavity was washed with hypertonic saline solution, which is recommended by the World Health Organization (Figure 2). Surgical incision was sutured by pledgeted prolene allowing self-closure via secondary healing in the patient 2 and 3 (Figure 2). Bioglue and U-sutures were used due to huge cystic cavity in the patient 1. Histopathological examination revealed the nonnucleated laminated membrane. All of the patients recovered uneventfully after an average postoperative hospital stay of 5.3 days (range 4–6). The mean follow-up was (14.30 ± 6.94) months (range 8–24). No mortality or sign of recurrence was detected during follow-up. There was no postoperative complication, such as myocardial tearing, atrioventricular block and ventricular arrhythmias. Albendazole (400 mg twice/daily) was administered to all patients pre-operatively and continued post-operatively for 4 weeks. The patients regularly presented for infectologic and cardiologic assessment.



**Figure 1.** Photographs of echocardiography and magnetic resonance imaging of the patients showing cystic hydatid lesions.

Figure 1A: Transthoracic echocardiogram revealed a large 4.8 cm × 2.8 cm well-defined cystic lesion in an intramyocardial interventricular septum in patient 1. Figure 1B; magnetic resonance imaging showed a 5.4 cm × 3.5 cm multiloculated lesion in the septobasal region of interventricular septum in patient 1. Figure 1C; Transthoracic echocardiogram revealed a cystic formation of 2.5 cm × 2.1 cm in dimension located at the intramyocardial left ventricle, close to inferoapical part of septum in patient 2.

**Table 1**

Clinical and surgical data of the patients.

Patient No	Age/Sex	Presentation	Electrocardiography	Location	Size by TTEa (cm)	Extracardiac hydatidosis
1	24/M	Dyspnea and fatigue	–	Inter-ventricular septum	4.8×2.8	Liver (prior operation) and spleen
2	44/M	Left sided chest pain	T wave changes in inferior LV, inferoapical part leads		2.5×2.1	–
3	46/M	Dyspnea	T wave changes in anterior leads	Inter-ventricular septum	3.6×2.4	–

<sup>a</sup>Transthoracic echocardiogram.



**Figure 2.** Germinative membrane was removed after initial sterilization procedure.

### 3. Discussion

Cardiac echinococcosis is an uncommon complication of hydatid disease, which mostly caused by the larval stage of *Echinococcus granulosus*[2]. Larvae reach the myocardium through the coronary circulation, and LV, which is the part of the heart with the most blood supply, is rarely involved (55%–60%)[3]. Clinical symptoms vary according to the size, location and complications of the cyst, but generally it remains asymptomatic. Symptoms can be presented due to compression of the atrioventricular conduction pathway and obstruction of the right or left ventricular outflow tract which clinically show itself with arrhythmia, angina, pulmonary or systemic embolism, and valvular dysfunction or anaphylactic reactions[4]. Echocardiography remains the most efficient method in the diagnosis of cardiac hydatid cyst. Operation is the treatment of choice for these conditions. It is important to consider early operative therapy because of the risk of rupture and anaphylaxis[5]. The important thing is choosing the approach and deciding to perform with or without extracorporeal techniques. It would be safe to perform surgery with the use of cardiopulmonary bypass, so that cross-clamping of the aorta prevents systemic embolization[6]. After removing the cyst, we left open for

self-closure in our cases due to location, because suturing could cause tearing during contractile activity. Despite the successful surgery as a treatment of cardiac hydatidosis, supplemental medical therapy should be administered to prepare for possible cyst rupture and dissemination of daughter cysts during the surgical procedure and to prevent recurrence of cysts. Eventhough it might be useful as a treatment when the surgery was contraindicated due to small or calcified cysts in elderly patients or rejected by the patient[7].

### Conflict of interest statement

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

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