Cardiac hydatid cyst mimicking left ventricular aneurysm and diagnosed by magnetic resonance imaging

Sol ventrikül anevrizmasını taklit eden ve tanısı manyetik rezonans görüntüleme ile konan kardiyak kist hidatik

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Summary – Cardiac involvement is an uncommon presentation of hydatid cyst disease, accounting for approximately 0.5-2% of all hydatidosis cases, and mainly occurring as part of a systemic infection. Herein, we report on an isolated cardiac hydatid cyst in a 57-year-old woman. She presented with a complaint of squeezing chest pain of 10 month-history. On transthoracic echocardiography, a mass like appearance with heterogeneous echogenicity was noted in the left ventricular wall, suggesting a primary cardiac tumor or a mass compressing the left ventricle. Thoracic computed tomography findings were reported as a calcified left ventricular aneurysm 50x65 mm in size and minimal pericardial fluid. Coronary angiography showed normal epicardial coronary arteries and an apical mass with calcified contours. Serological test was negative for echinococcal disease. Cardiac magnetic resonance imaging showed a cystic lesion, 54x48 mm in size, in the left ventricular anterolateral wall, protruding into the lumen. After albendazole treatment for four weeks, surgery was performed for excision of the cyst. During the operation, rupture of the cyst was noted. The diagnosis of cardiac hydatid cyst was confirmed by pathological examination. During a six-month follow-up, the patient was asymptomatic, with no cystic appearance on transthoracic echocardiography.

Özet – Kist hidatik hastalığında kardiyak tutulum yaygın olmayan bir durumdur, tüm hidatidozis olgularının yaklaşık %0.5-2'sinde görülür ve esas olarak sistemik enfeksiyonun bir parçasıdır. Bu yazıda, 57 yaşındaki kadın hastada rastlanan izole kardiyak kist hidatik sunuldu. Hasta 10 aydır var olan sıkıştırıcı göğüs ağrısı yakınmasıyla başvurdu. Transtorasik ekokardiyografide, sol ventrikül duvarında, primer kardiyak tümörü ya da sol ventrikülü sıkıştıran kitle akla getiren, heterojen ekogenisitede kitle benzeri bir görüntü izlendi. Göğüs bilgisayarlı tomografi bulguları, 50x65 mm boyutlarında kalsifiye sol ventrikül anevrizması ve hafif perikart sıvısı şeklinde bildirildi. Koroner anjiyografide epikardiyal koroner arterler normal bulunurken, kalsifiye sınırları olan apikal bir kitle görüldü. Serolojik test sonucu ekinokok hastalığı için negatif bulundu. Kardiyak manyetik rezonans görüntülemede ise, sol ventrikül anterolateral duvarında, lümen içine taşan, 54x48 mm boyutlarında kistik lezyon görüldü. Dört haftalık albendazol tedavisinden sonra kistin çıkarılması için cerrahiye başvuruldu. Ameliyatta kistin patlamış olduğu görüldü. Kardiyak kist hidatik tanısı patolojik incelemeyle doğrulandı. Altı aylık izlem sırasında hastanın yakınması yoktu ve transtorasik ekokardiyografide kistik görünüm izlenmedi.

Echinococcosis is an important health problem in sheep- and cattle-raising countries that usually involves the liver and lungs. Cardiac involvement is not a common presentation of echinococcosis (0.5-2%) mostly due to myocardial contractions.[1,2] Cardiac involvement is usually a component of multivisceral involvement and the left ventricular wall is the most frequent site. However, in rare cases, isolated involvement of the heart can be seen which can be mistaken for left ventricular aneurysm or atrial myxoma. Although serological tests together with im-

Abbreviations:

CT	*Computed tomography*
MRI	*Magnetic resonance imaging*
TTE	*Transthoracic echocardiography*

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aging techniques are the most important diagnostic tools, false negative results may lead to a missed diagnosis.[3] In such instances, suspicion plays a significant role in the diagnosis of the disease. In this case report, we present a patient with a seronegative cardiac hydatid cyst that mimicked a left ventricular aneurysm and was diagnosed by clinical suspicion and magnetic resonance imaging.

CASE REPORT

A 57-year-old woman was admitted to our hospital with a complaint of chest pain of 10 month-history. The chest pain was squeezing in character, lasting more than 10 minutes and radiating to the back with an increment in severity for the past two months. She had had hypertension for four years without other systemic illness and had been taking lisinopril and hydrochlorothiazide. She was living in a rural area in the southeastern part of Turkey. There was no dyspnea or chest pain at rest, but she complained of exertional dyspnea for six months. On admission, her pulse rate was regular with 84 beats/min, blood pressure was 140/90 mmHg, and body temperature was 37.6 °C. Physical examination was normal except for mild apical systolic murmur. Complete blood count, blood biochemistry, and thyroid function tests were all in normal limits. Total leucocyte count was 9,900/mm^3 (1.1% eosinophils). Electrocardiography showed sinus rhythm with negative T wave in D1-aVL and abnormal R wave progression in V1-V3 leads. On transthoracic echocardiography, left ventricular ejection fraction was 40% and end-diastolic diameter was 5.3 cm. A mass like appearance with heterogeneous echogenicity was also noted in the left ventricular wall, which was initially thought to be a primary cardiac tumor or a mass compressing the left ventricle (Fig. 1a). Thoracic computed tomography findings were reported as a calcified left ventricular aneurysm having a transverse diameter of 50 x 65 mm and minimal pericardial fluid (Fig. 1b). Coronary angiography showed normal epicardial coronary arteries and an apical mass with calcified contours (Fig. 2). Cardiac hydatid cyst was suspected in the differential diagnosis. However, serological findings with indirect hemagglutination test were negative for echinococcal disease. Cardiac MRI was performed, which showed a cystic lesion, 54 x 48 mm in size, in the left ventricular anterolateral wall, protruding into the lumen. The lesion was hypointense on T1A sequences and hyperintense on T1 and T2A images, but was not suppressed on fat suppression sequences, which was compatible with a cystic mass with dense content with accompanying anterolateral wall motion abnormality in cine images (Fig. 3). Finally, the MRI of the lesion was consistent with cardiac hydatid cyst. The lungs and liver were free of cystic lesions on CT. After preoperative administration of albendazole for four weeks, surgery was performed involving cyst excision and capitonage. During the operation, the cyst cavity was filled with SurgiSeal and fibrin glue. Rupture of the cyst content was noted into the left ventricular wall. There was no relationship between the cyst and left ventricular cavity. The diagnosis was confirmed by pathological examination postoperatively. The patient was discharged uneventfully on albendazole treatment.

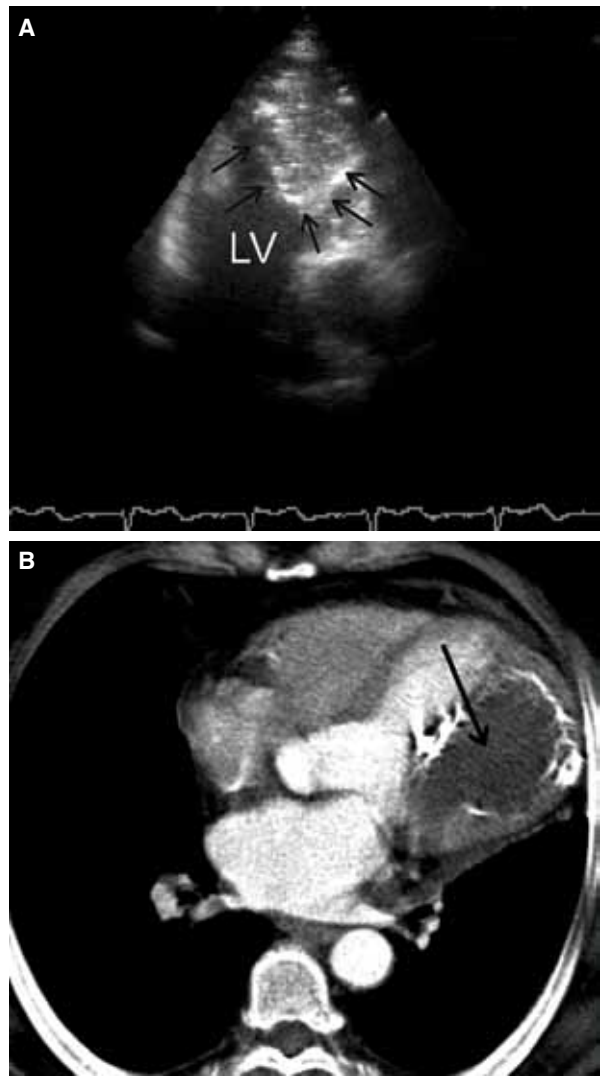

Figure 1. **(A)** Transthoracic echocardiography (apical 2-chamber long-axis view) shows a mass appearance (arrows) with heterogeneous echogenicity. **(B)** Computed tomographic view shows a lesion (arrow) 50 x 65 mm in transverse diameter suggesting a calcified left ventricular aneurysm.

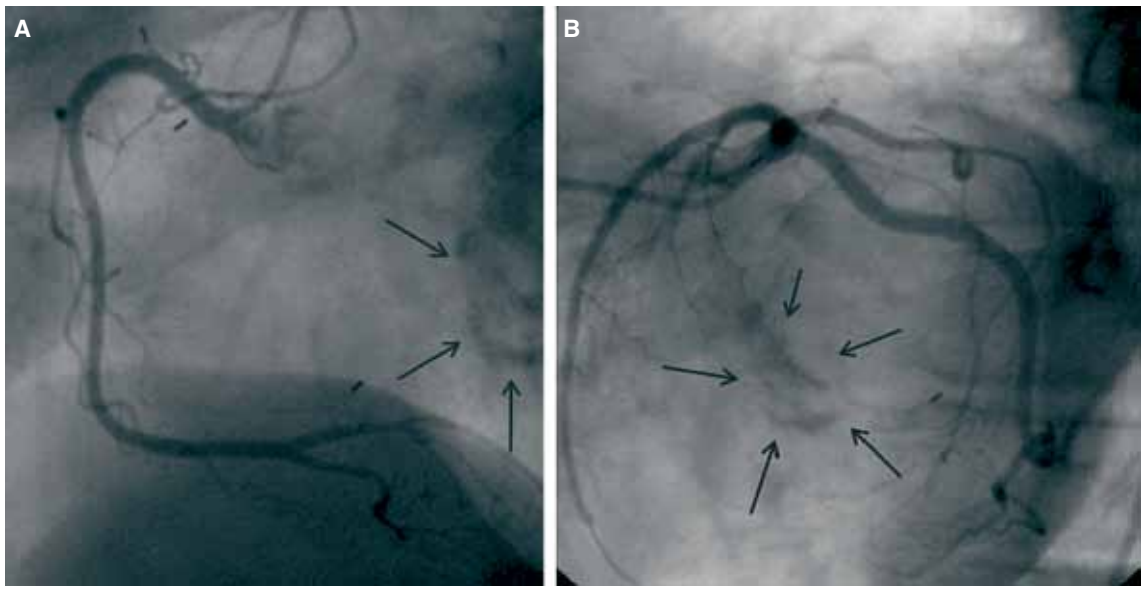

Figure 2. Coronary angiograms of **(A)** normal right coronary artery and **(B)** left coronary artery and a mass with calcific contours on the ventricular wall (arrows).

At the six-month control, she was asymptomatic and TTE showed left ventricular ejection fraction as 54% with no cystic appearance.

DISCUSSION

Echinococcosis is a zoonosis caused by adult or larval stages of cestodes belonging to the genus of Echinococcus. Larval infection is characterized by growth of hydatid cysts in an intermediate host. *Echinococcus granulosus* and *E. multilocularis* are the two major species of medical importance, causing cystic echinococcosis and alveolar echinococcosis, respectively. Hydatid cysts of *E. granulosus* develop mainly in the liver and lungs, but rarely in the heart. Although *E. granulosus* has a worldwide distribution, Middle East, Mediterranean countries including Turkey, and South America represent hyperendemic areas.[4]

Cardiac echinococcosis is a rare manifestation of hydatid cyst. Signs and symptoms of cardiac hydatid cysts are extremely variable and directly related to the location and size of the cysts. Probably only 10% of patients especially those having a large hydatid cyst have clinical manifestations.[5] Chest pain, palpitations, and dyspnea are the primary symptoms associated with cardiac echinococcosis.[6] Chest pain is a common symptom and mostly do not resemble angina pectoris. In case of a pericardial hydatid cyst, pericardial chest pain can be observed due to pericardial inflammation. Larvae reach the myocardium through coronary circulation and left ventricular wall is the most frequent site of cardiac involvement.[7] Additionally, cardiac hydatid disease can mimic left ventricular aneurysm, atrial myxoma, or cardiac malignancies such as angiosarcoma.[8] Involvement of the myocardium may lead to life-threatening complications, including cyst rupture, anaphylactic shock, tamponade, pulmonary, cerebral or peripheral arterial embolism, acute coronary syndrome, dysrhythmias, infection, ventricular or valvular dysfunction. The primary treatment of cardiac hydatid cysts is surgical excision.[7]

The diagnosis of cardiac echinococcosis is mainly based on the combination of clinical suspicion, cardiac imaging, and serologic tests. A past medical history of hydatid cyst may suggest the diagnosis, but cardiac involvement should be kept in mind even in the absence of past medical illness, especially in highly endemic regions. Electrocardiography may show nonspecific changes including T wave abnormalities. Echocardiography is a highly sensitive and specific tool in the diagnosis and shows the effect of the lesion on ventricular or valvular functions, but additional imaging modalities including CT and MRI may be needed in case of unclear findings on TTE. Moreover, cardiac CT and MRI can give additional information on the precise location and relation of the lesion with extracardiac structures.[9] Antibody assays are useful to confirm the presumptive radiologic diagnosis, although some patients with cystic echinococcosis do not demonstrate a detectable immune response. A positive serological

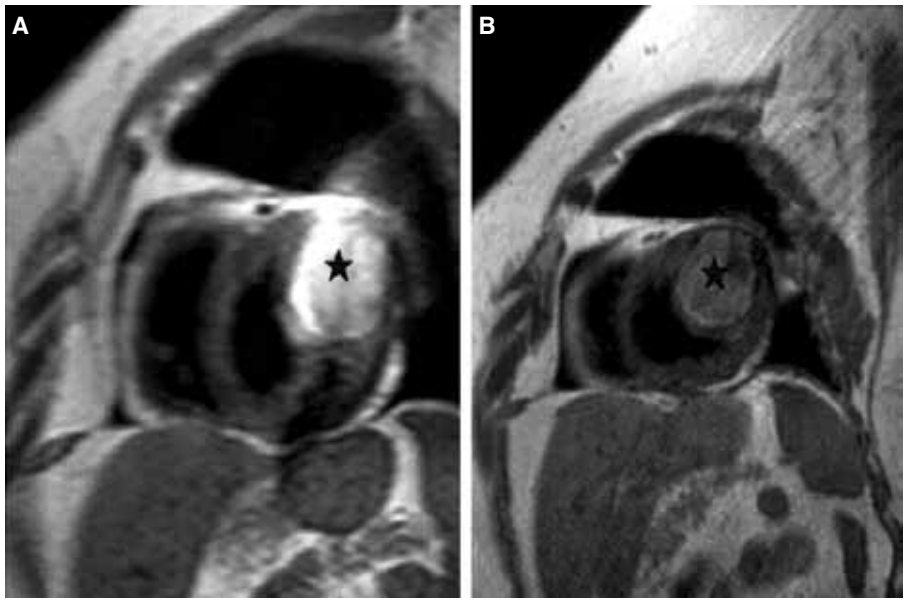

Figure 3. Cardiac magnetic resonance scans show a cystic lesion in the left ventricular anterolateral wall. The cyst is hyperintense on T1- and T2A-weighted black blood images, not suppressed in fat suppression sequences. Cystic dense content is **(A)** hyperintense on T2A sequence (star) and **(B)** hypointense on T1A sequence (star).

test is valuable, but negative test results do not exclude the diagnosis.[10]

Our patient presented with typical chest pain which is a rare symptom in cardiac echinococcosis. Typical chest pain mainly occurs in case of a cyst compressing the coronary arteries. Although TTE is a useful and sensitive diagnostic tool in patients with cardiac echinococcosis, the lesion exhibits a mass-like appearance with heterogeneous echogenicity on TTE and additional cardiac imaging may be needed. In our case, cardiac hydatid cyst was suspected in the differential diagnosis after angiographic observation of a calcified lesion in the ventricular wall. Serological indirect hemagglutination test showed a negative result, but this did not exclude the diagnosis of hydatid cyst disease. Eosinophilia is a common finding in patients with parasitic infections, but it is not always seen. Thus, especially in endemic areas, clinical suspicion is very important for the accurate diagnosis. Computed tomography is also important in the diagnosis, but especially in case of cyst rupture into the myocardium, the patient can be misdiagnosed as left ventricular aneurysm. If hydatid cyst is indistinguishable by other techniques, cardiac MRI can provide conclusive information. In our case, cardiac hydatid cyst was diagnosed after cardiac MRI and appropriate treatment with surgery was performed. The use of surgical sealants (fibrin glue) within the cystic cavity is an original approach. Fibrin sealant is a surgical hemostatic agent derived from plasma coagulation proteins, becoming increasingly popular in a number of surgical settings.[11,12] These hemostatic agents are efficacious in reducing blood loss during and after surgery and reduce the need for blood transfusions. This approach is also important in patients undergoing cardiac surgery including ventricular incision.[13] In our patient, despite rupture of the hydatid cyst into the left ventricle, there was no life-threatening complication such as anaphylactic reaction due to no leakage into the blood stream.

Finally, cardiac hydatid cyst should be considered in the differential diagnosis of heterogeneous echogenic masses on TTE in endemic areas even if the serologic tests are negative. Cardiac MRI can give valuable information on both the lesion and its relation to other cardiac and extracardiac structures.

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