

# Role of Transesophageal Echocardiography in Diagnosis and Management of Cardiac Hydatid Cyst: Report of two cases and review of the literature

Uz. Dr. Tufan TÜKEK, Uz. Dr. Şeref DEMİREL, Prof. Dr. Dursun ATILGAN,  
Prof. Dr. Ertan ONURSAL\*, Prof. Dr. Ferruh KORKUT

Cardiovascular Disease Research Center, \*Department of Cardiothoracic Surgery, Istanbul Medical Faculty Istanbul, Turkey

## KARDİAK KİST HİDATİK TANI VE TEDAVİSİNDE TRANSÖZOFAGEAL EKOKARDİYOGRAFINİN ÖNEMİ: İKİ VAKA NEDENİ İLE LİTERATÜRÜN GÖZDEN GEÇİRİLMESİ

### ÖZET

Burada nadir görülen 2 kardiyak kist hidatik olgusu sunulmakta, transözofajiyal ekokardiyoğrafının (TEE) tanı ve tedavideki rolü tartışılmaktadır. İlk vakada, sağ atrial kist hidatik operasyonu sırasında TEE yardımı ile vena kavalanın kanüle edilmesi ve kistin cerrahi olarak çıkarılması bildirildi. İkinci vakada, aralarında TEE' nin de bulunduğu değişik görüntüleme yöntemleri ile değerlendirilen, çok sayıda dejeneratif perikardial kist hidatiği olan bir hasta sunuldu. Sonuç olarak, TEE kardiyak kist hidatik tanı ve cerrahi tedavisinde kullanılan faydalı bir yöntemdir.

**Anahtar kelimeler:** Kardiyak kist hidatik, transözofajiyal ekokardiyografi

Cardiac hydatid cyst is rare, and the most common involvements are left ventricular wall and septum (1). Surgical excision is the treatment of choice for cardiac hydatid cyst because of its possible fatal complications (2). Although the diagnostic value of transthoracic echocardiography (TTE) is well established, there are very few reports of the use of transesophageal echocardiography (TEE) as an aid to diagnosis and/or treatment (3-5). In this report, we present 2 unusual cases of cardiac hydatid cyst and discuss the role of TEE in the diagnosis and treatment.

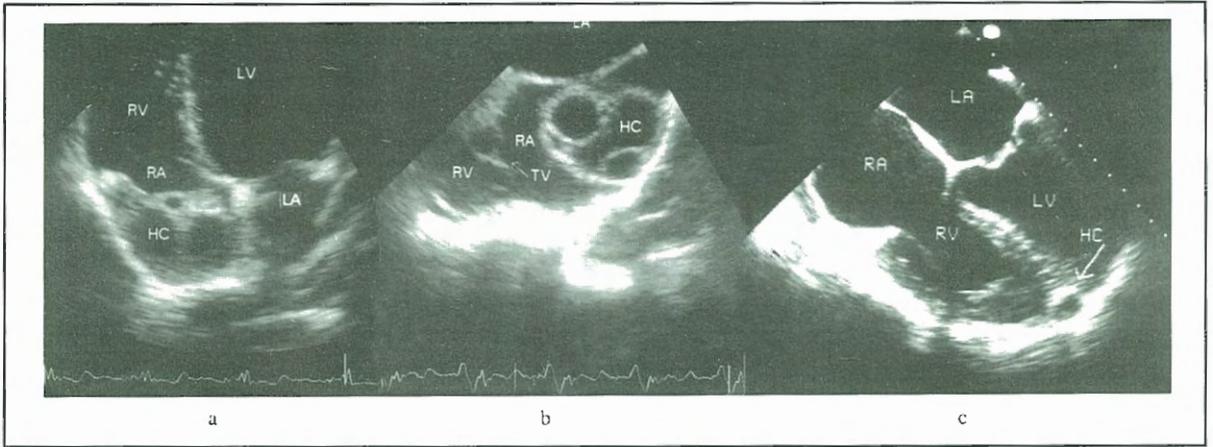
### REPORT of CASES

**Case 1.** A 26-year-old woman with history of hydatid cyst in the liver was admitted for palpitation and dyspnea on

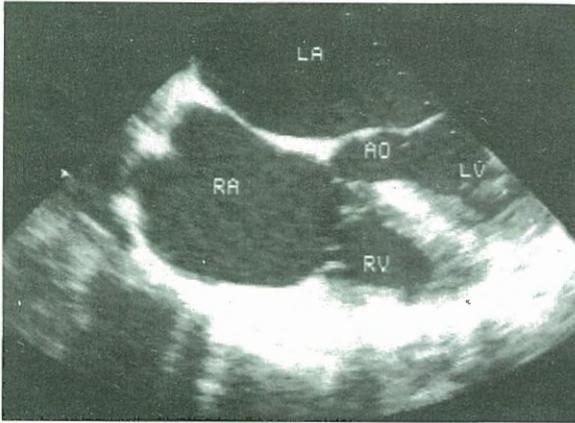
mild exertion. The cardiac findings, ECG and chest film were unremarkable. It was demonstrated with TTE a large, single, trabeculated hydatid cyst (5 x 4.5 cm) in the right atrium (Fig. 1a). In order to rule out the presence of the smaller cysts in the heart and great blood vessels and to determine the relationship between the cyst and cardiac structures, TEE with omniplane probe was performed. The cyst was located on the right atrial free wall, causing no obstruction to superior or inferior vena cavae and to the tricuspid valve. No other cyst was detected in the heart and great blood vessels, and interatrial septum was also intact (Fig. 1b). Due to concerns for cyst perforation during cannulation of right atrium and during cyst exposure, surgical treatment under TEE guidance was recommended. The cannulation was done from superior and inferior vena cavae. The cyst, which included many daughter cysts, was exposed under TEE guidance with atrial incision and was totally removed together with a part of the right atrial free wall because of its tight attachment. Reconstruction was made using parietal pericardium. TEE was repeated before closure of the thorax to rule out residual cysts (Fig. 1c). The patient was discharged with albendazole therapy a week later. At her 1.5 years follow-up she was doing well.

**Case 2.** A 51-year-old woman was admitted with dyspnea on mild exertion, and abdominal discomfort. She had undergone surgery for pericardial hydatid cyst 6 years ago. On physical examination, prominent edema of the legs and large ascites were noticed. Jugular veins were distended to 6 cm at 45 degrees, and there were rales at both lower lung fields. The ECG revealed atrial fibrillation, and chest roentgenogram displayed an enlarged cardiac silhouette. Because of her poor echogenicity, we were not able to make an adequate TTE examination. Transesophageal echocardiography demonstrated a single pericardial cyst (1.5 x 1.5 cm) at the apex that protruded into the interventricular septum and four-chamber dilatation with moderate left ventricular dysfunction (Fig. 2). Computed tomography (CT) only confirmed the TEE findings (Fig. 3a). Additionally, magnetic resonance imaging (MRI) revealed multiple degenerative pericardial cysts located in the diaphragmatic and apical regions of the heart (Fig. 3b). Neither CT nor MRI displayed another organ involvement. We believed that the patient was not a surgical candidate and did not undergo surgery. The patient was treated medically with digoxin, furosemide, aldactone, and albendazole, and ACE inhibitor.

Alındığı tarih: 4 Ekim, revizyon 24 Ekim 1999  
Address for correspondence: Tufan Tükek, MD, İstanbul Üniversitesi, İstanbul Tıp Fakültesi Kalp Damar Araştırma ve Uygulama Merkezi  
Tlf: (0 212) 534 00 00- 17 68 Faks:+ (0 212) 534 09 34



**Fig 1.** a) Transthoracic echocardiographic apical four-chamber view of the heart (case 1) shows the hydatid cyst in the right atrium. HC = hydatid cyst; LA = left atrium; LV = left ventricle; RA = right atrium; RV = right ventricle. b) Preoperative transesophageal echocardiogram showing the cyst in the right atrium (case 1). HC = hydatid cyst; LA = left atrium; RA = right atrium; RV = right ventricle; TV = tricuspid valve. c) Intraoperative transesophageal echocardiogram after removal of the cyst, but just before closure of the chest (case 1). AO = aort; LA = left atrium; LV = left ventricle; RA = right atrium; RV = right ventricle.



**Fig 2.** Transesophageal echocardiogram (case 2) shows the single pericardial hydatid cyst. ; HC = hydatid cyst; LA = left atrium; LV = left ventricle; RA = right atrium; RV = right ventricle.

## DISCUSSION

Cardiac involvement of hydatid cyst is rare and usually occurs in 1% of patients infested with *Echinococcus Granulosus*. The most common location of the cardiac hydatid cyst are the left ventricular free wall (52%), interventricular septum (42%), and less frequently the right ventricle (31%), pericardium (10%), or the atrium (1,6). In a review of the literature, we were able to find 9 cases of right atrial hydatid cyst (4,7-14).

Four (45%) of the cases died of massive pulmonary hydatid embolism, one 3 months after surgery, 2 others before operation. The case of Kardaras et al. (11) died of massive pulmonary embolism due to rupture of the fragile cyst during cannulation for total cardiopulmonary bypass. Due to these reports it

was thought best for the patients to be assessed for obstruction of superior and inferior vena cavae with TEE and the cannulation and cyst exposure monitored during surgery. In our first patient, the cyst was successfully removed under the TEE guidance, and no complication did occur.

Although CT and MRI provide valuable information, TTE has been accepted to be the imaging procedure of choice for the diagnosis of cardiac hydatid cyst, but the diagnostic value of TEE in this entity is not known. To our knowledge, there are only 3 cases of cardiac hydatid cyst in the literature in which TEE has been used in the diagnosis or surgical management. The first case, reported by Urbanyl et al. (3), was a cyst localized at the interventricular septum and perforated into the pericardium. The second case, reported by Ambrosi et al. (4), was a cyst in the inferior vena cava, which mimicked a cardiac thrombus with right atrial extension. The third report detailed a case of a large single hydatid cyst in the left ventricle in which an adequate parasternal short-axis view was not possible to obtain during TTE, and the cystic involvement of the anterolateral papillary muscle was only demonstrated in transgastric view during the TEE examination (5).

It was previously reported that pericardial hydatid cyst can induce myocardial dysfunction and present as right sided heart failure like our second case (15). Although TEE and computed tomography demonstrated a typical cystic image in the

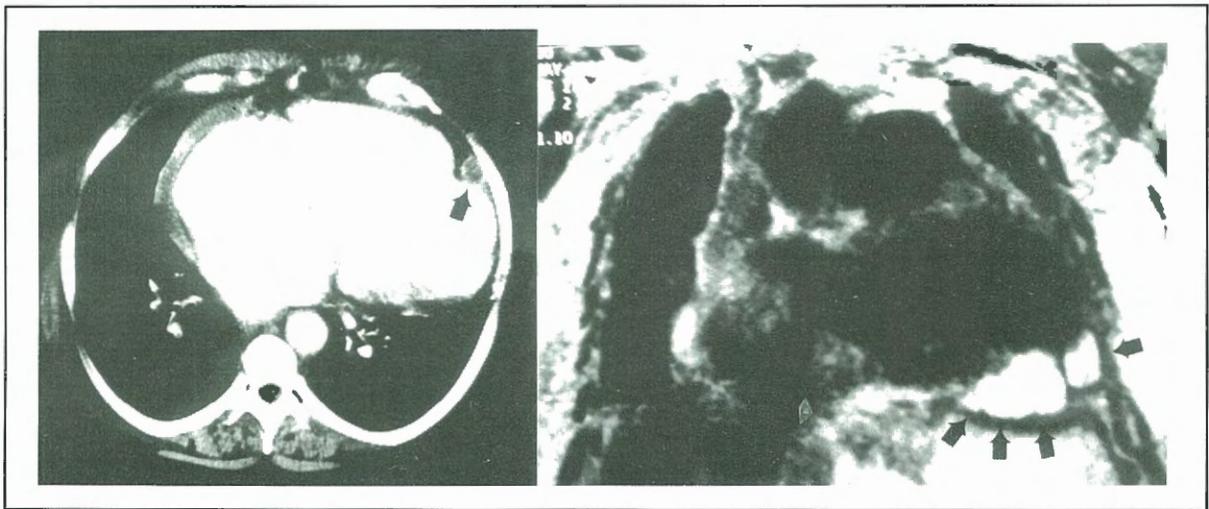


Fig 3. Computed tomographic axial image (case 2). Arrow points to the cyst. and spin-echo magnetic resonance imaging, coronal section (case 2). Arrows show the multiple degenerative pericardial cysts.

pericardium in the second case, the multiple degenerative cysts were only noticed on MRI.

The cardiac hydatid cyst, which is rare but usually associated with fatal complications, can be diagnosed by several imaging modalities. Although there are limited number of reports, we think that TEE is helpful for both the diagnosis and successful surgical treatment. Magnetic resonance imaging may also provide additional information that can not be obtained on the TEE examination.

## REFERENCES

1. Bashour TT, Alali ARK, Mason DT, Saalouke M: Echinococcosis of the heart: clinical and echocardiographic features in 19 patients. *Am Heart J* 1996;132:1028-30
2. Perez-Gomez F, Duran H, Tamames S, Perotte JL, Blaner A: Cardiac echinococcosis. Clinical picture and complications. *Br Heart J* 1973;35:1326-31
3. Urbanyl B, Rieckmann C, Hellberg K, Krakau M, Liebau G, Mayer A, et al: Myocardial echinococcosis with perforation into the pericardium. *J Cardiovasc Surg* 1991;32:534-8
4. Ambrosi P, Mesena T, Habib G, Boulain L, Lambert M, Simeoni JB, et al: Right intra-atrial extension of hydatid cyst mimicking cardiac thrombosis [in French]. *Arch Mal Coeur Vaiss* 1992;85:909-12
5. Atilgan D, Demirel S, Akkaya V, Korkut F: Left ventricular hydatid cyst: an unusual location of *Echinococcus Granulosus* with multiple organ involvement. *J Am Soc Echocardiogr* 1996;9:212-5
6. Oliver JM, Sotillo JF, Dominguez FJ, de Sa EL, Calvo L, Salvador A, et al: Two-dimensional echocardiographic features of echinococcus of the heart and great blood vessels: clinical and surgical implications. *Circulation* 1988;78:327-37
7. Miralles A, Bracamonte L, Pavie A, Bors V, Rabago G, Gandjibakhch I, et al: Cardiac echinococcosis. Surgical treatment and results. *J Thorac Cardiovasc Surg* 1994;107:184-90
8. Gilsanz V, Campo C, Cue R, Estella J, Estrada RV, Perez-Oteiza C, et al: Recurrent pulmonary embolism due to hydatid cyst of heart. Study of 3 cases, one with intermittent tricuspid valve obstruction (atrial pseudomyxoma). *Br Heart J* 1977;39:553-8
9. De Castro S, Santilli M, Brandimarte C, Gualdi G, Migliau G: Role of noninvasive diagnosis in cardiac echinococcosis: pulmonary embolization from right atrial localization [in Italian]. *Cardiologia* 1991;36:817-21
10. Rey M, Alfonso F, Torrecilla EG, Mc Kenna WJ, Balaguer J, Alvarez L, et al: Diagnostic value of two-dimensional echocardiography in cardiac hydatid disease. *Eur Heart J* 1991;12:1300-7
11. Kardaras F, Kardara D, Tselikos D, Tsoukas A, Exadactylos N, Anagnostopoulou M, et al: Fifteen year surveillance of echinococcal heart disease from a referral hospital in Greece. *Eur Heart J* 1996;17:1265-70
12. Ege E, Soysal O, Gulculer M, Ozdemir H, Pac M: Cardiac hydatid cyst causing massive pulmonary embolism. *Thorac Cardiovasc Surg* 1997;45:249-50
13. Jeridi G, Boughzala E, Hajri S, Hediji A, Ammar H: Complicated hydatid cyst of the right atrium simulating myxoma of the tricuspid valve [in French]. *Ann Cardiol Angeiol* 1997;46:159-62
14. Kabbani SS, Jokhadar M, Sundouk A, Nabhani F, Baba B, Shafik AI: Surgical management of cardiac echinococcosis. Report of four cases. *J Cardiovasc Surg* 1992;33:505-10
15. Al Naaman YD, Al-Omeri MM: Cardio-pericardial echinococcosis causing myocardial insufficiency, right-sided heart failure and constrictive pericarditis. Report of four cases and review of the literature. *J Cardiovasc Surg* 1970;11:303-9