Radiology Case Reports 16 (2021) 3829–3833

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case report

Cardiac hydatid cyst: 2 case reports ☆

Siham Nasri, MD[a,*], *Narjiss Aichouni, MD*[a], *Salma Lokman, MD*[a], *Noha El Ouafi, MD*[b], *Imane Kamaoui, MD*[a], *Imane Skiker, MD*[a]

[a] *Department of Radiology, Mohammed VI University Hospital, Faculty of Medicine, University Mohammed First, BP 4806 Oujda Universite, Oujda 60049, Morocco*

[b] *Department of Cardiology, Mohammed VI University Hospital, Faculty of Medicine, University Mohammed First, Oujda, Morocco*

ARTICLE INFO

Article history:
Received 6 August 2021
Revised 31 August 2021
Accepted 4 September 2021

Keywords:
Hydatid cyst
Heart
CT scan
MRI
Case report

ABSTRACT

Hydatidosis is a parasitic disease that is still prevalent in regions that rear farm animals, notably along the Mediterranean coast. The liver and lungs are most commonly involved. Cardiac hydatidosis has been reported infrequently even in countries in which hydatid disease is endemic. This entity must be known because when undiagnosed and untreated, the risk of fatal complications increases. We report 2 cases of cardiac echinococcal cysts in young men. The first case is an incidentaloma in a patient admitted for pancreatitis. The second case is about a patient admitted for dyspnea. CT scan and MRI were performed showing intraventrucular cystic mass with a calcified wall which was very suggestive of a hydatid cyst diagnosis. We would like to emphasize the relevance of imaging in this context and shade some light on imaging diagnostic tools.

Introduction

Hydatid cyst disease is a significant health problem for undeveloped and developing countries. Its long-term outcome has been profoundly impacted by new therapeutical possibilities and prophylactic measures [1]. Echinococcosis is a tissue infection caused by Echinococcus granulosus larva in humans. It is endemic in sheep-raising locations around the world, including the Mediterranean countries, North Africa, Australia, China, central Europe, New Zealand, and Latin America. Four countries are reported to be highly endemic: Uruguay (32/100000), Argentina (21/100000), Tunisia (15/100000), and Morocco (7,2/100000), but Kenya remains the main epidemic focus of human hydatid disease [2,3]. Cardiac echinococcosis appears in 0.5-2% of patients usually having liver or lung hydatid cysts [4].

Case report

Case 1

A 29-year-old man consulted in the ER for acute epigastralgia. Except for epigastric tenderness, the patient's physical

☆ Competing interests: The authors declare that they have no conflicts of interest.

* Corresponding author.
E-mail address: nasri_siham@hotmail.fr (S. Nasri).

https://doi.org/10.1016/j.radcr.2021.09.013

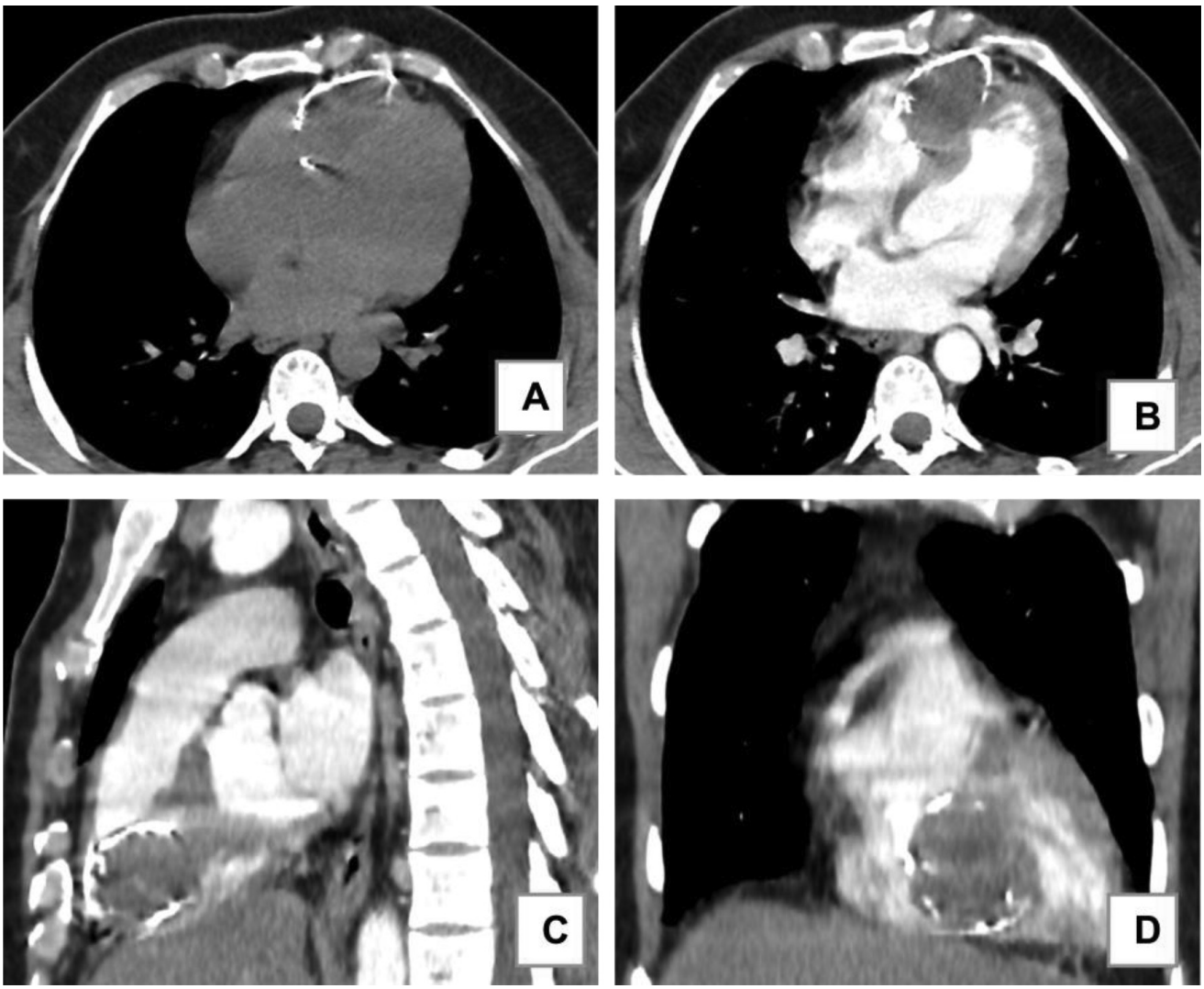

Fig. 1 – Interventricular hydatid cyst in a 29-year-old man.
Unenhanced (A), contrast-enhanced(B) axial CT images and multiplanar reconstuctions (C, D) obtained with mediastinal window showing a massive cystic mass emerging from the interventricular septum and extending into the right ventricular cavity with well-defined partially calcified edges.

examination showed no unusual symptoms. He presented no respiratory or cardiac symptoms abnormalities. An increased lipase was reported during the hematologic and biochemical laboratory workup. The abdominal US identified no signs of cholecystitis or ascites. An abdominal CT scan was performed 3 days after the identification of stage D pancreatitis. It also showed a cystic mass of the interventricular septum with a calcified wall which was very suggestive of a hydatid cyst diagnosis (Fig. 1).

Serologic tests and ECG were all negative. A deeper search in the medical history of the patient found out that he underwent surgery 13 years before for liver and thyroid cysts, and again 3 years before for a leg soft tissue cyst. No other localisations were identified. The decision was to avoid surgery because of the calcified nature of the cyst wall and its asymptomatic character. The follow-up is uneventful.

Case 2

A 19-year-old patient was presented to our hospital complaining of marked respiratory distress with dyspnea. The physical examination revealed 30 cycles/min respiratory frequency and muffled heart sounds. The ECG showed no alterations. The patient had eosinophilia and increased levels of D-Dimer. Thoracic CT angiography identified a pulmonary embolism and a cystic mass of the right ventricle with a partially calcified wall (Fig. 2). The echocardiographic and MRI (Fig. 3) characteristics of the mass suggested the probability of a hydatid cyst.

The patient underwent surgery, and the cyst was successfully resected after it was discovered in the pericardium. The diagnosis of echinococcosis was confirmed by pathologic examination. The patient follow-up is satisfying.

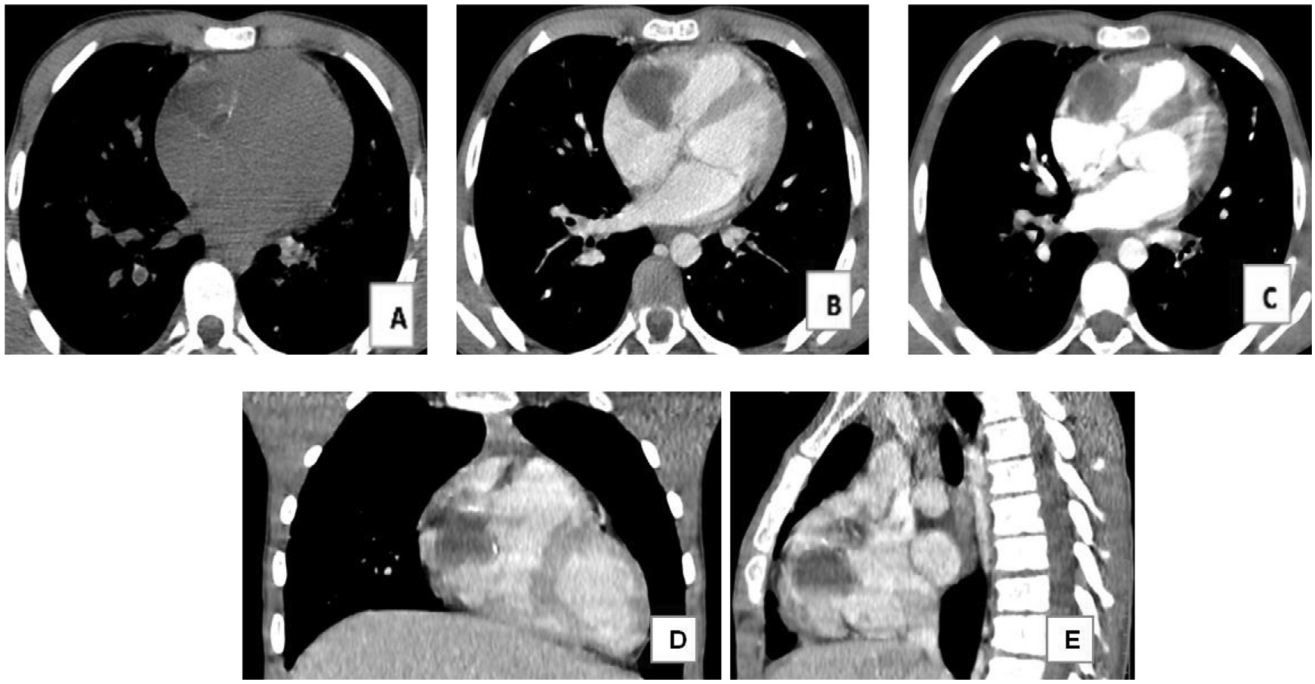

Fig. 2 – Interventricular hydatid cyst in a 19-year-old man.
Unenhanced (A), contrast-enhanced (B, C) axial CT images with coronal and sagittal reconstuction (D, E) obtained with mediastinal window, showing a cystic lesion located in the region of the right ventricule, with partial wall calcifications.

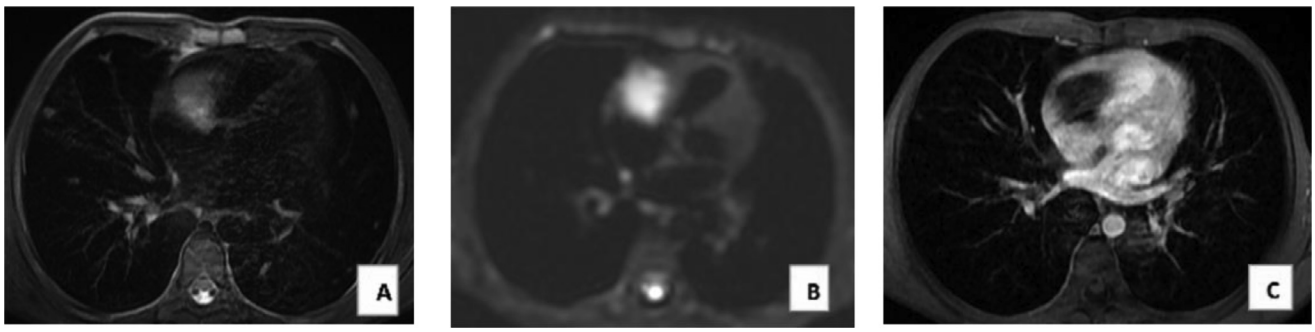

Fig. 3 – Cardiac MRI showing a heterogeneous well-defined intramyocardial cyst displaying hyperintensity on T1 weighted images (A) and diffusion imaging (B), with no contrast enhancement after intravenous gadolinium injection (C).

Discussion

After the invasion of the myocardium through the coronary artery. The left ventricle, the heart portion with the most abundant blood flow, is the most usually involved (50%-60%). The interventricular septum is reported to be involved 10%-20% of the time. Hydatid cysts have been reported to emerge from the right ventricular myocardium (5%-15%), the pericardial (10%-15%), and the right and left atrial (5%-8%) [5]. The right ventricle Hydatid cysts of are usually subendocardial. Therefore, intracavitary rupture is more common in the right ventricle localization (88% versus 37% in the left ventricle localization) [6]. Cardiac localization of hydatid cyst is rarely multiple. It can also be isolated without another visceral localization in 50%-65% of the cases [5].

The symptoms and the clinical signs differ depending on the effect, number, location, and size of the cysts. However, cardiac hydatid cysts are usually asymptomatic and the discovery is fortuitous on chest radiographs, echocardiography, or as a component of investigating multiorgan echinococcosis [7].

When they are symptomatic, chest pain is most common; dyspnea, palpitations, angina, heart rhythm disorders, and fever are also seen [8].

Hypereosinophilia is encountered in 20%-30% of cases especially in ruptured cysts [9]. Serologic tests such as immunoglobulin ELISA, indirect hemagglutination, IEF (arc 5), and Immunoblot (IB) are useful to confirm the presumptive radiologic diagnosis. However, they should be interpreted carefully: The presence of high titers of anti-Ecchinococcus antibodies is valuable, but negative test results do not exclude

the diagnosis. Serology is particularly helpful to identify inactive cysts: an inactive cyst is calcified, inferior to 5 cm, asymptomatic, and presenting negative serologic tests [10]. The immunoglobulin ELISA and indirect hemagglutination have proven to be the most effective in follow-up. [11].

Several techniques are usually used to identify and characterize the cyst wall, its content, and its extensions to nearby structures: cardiac chambers, mediastinum, and lungs.

Chest radiographs can show alterations that are not specific to the disease. It could show localized cardiac silhouette deformities, cardiomegaly or a calcified lobular mass close to the ventricles [12]. When the cyst is small or presenting an intra cardiac growth, chest radiographs are usually without abnormalities [13]. Chest radiographs can also show lung localizations of the hydatid disease.

The diagnostic capacity of the transthoracic 2-dimensional echocardiography and/or transesophageal echocardiography is excellent. It can show an anechoic cyst with a thin wall. Membrane detachment or multivesicular structures are very specific signs [14,15]. This technique determines also the location of the hydatid cyst, its size, and its relation to adjacent structures especially the myocardial wall, valves, and coronary arteries.It is however limited by the patient morphotype, corpulence, and the depth of auricular and septal structures [16].

Computed tomography with cardiac synchronization provides further information as to morphological characteristics of the cyst and its extent to adjacent structures. This has been made possible thanks to the recent progress in spatial resolution and multiplanar reconstructions of spiral CT scanners.

Cardiac hydatid cyst typically appears as an enhanced low-density lesion with well-defined contour and thin wall, usually univesicular. Wall calcifications, when present, are specific. A thoracoabdominal CT identifies other organs' possible involvement (40% of cases) [17]. Gharbi classification of hydatid cyst was the first imaging-based classification to be adopted [18]. It is presently being replaced by the OMS classification (developed by the OMS Informal Working Group on Echinococcosis [19], which correlates imaging findings and HC staging, and therefore dictates therapeutic strategies.

Cardiac MRI is performed with ECG triggering for more precision in the morphological, topographic, and operational assessment. Cine magnetic resonance imaging of the heart particularly provides valuable information concerning the cyst movements versus cardiac movements. This method also evaluates the exact lesion insertion location, its fixated character, its deformability, the rupture risk as well as the impact on myocardial contraction [16]. It is the technique used for post-treatment follow-up [20].

MRI shows typically a hyperintense lesion on T2-weighted images and a hypointense lesion on T1-weighted images. On T2-weighted images, a hypointense peripheral ring representing the pericyst (a dense fibrous capsule from the reactive host tissue) is a typical finding [21]. The cystic mass's multivesicular nature is a particularly distinctive sign [16,22].

MRI diagnosis main criteria include: a hyperintense signal on T2-weighted images (liquid content) and a hypointense signal on T1-weighted images, peri cystic hypointense ring « double-line sign », daughter cysts: « cyst inside the cyst », specific detached endocyst: hypointense linear signal inside the cyst « Rim sign », wall calcifications (more reliably detected in CT imaging), absence of contrast enhancement of the cyst wall (except for infected cysts) [7,16].

A range of cardiac tumors must be regarded as a potential differential diagnosis, particularly in the case of the cyst pseudotumoral aspect [16]. It is the case in the left ventricular aneurysm, myxoma, fibroma, rhabdomyoma, and cardiac sarcoma. Intracardiac thrombus and pericardial calcifications related to other etiologies could also lead to confusion. However, the cystic mass multivesicular nature and membrane detachment are pathognomonic elements [20,23].

Cyst involution and/or full calcification were reported in 12% of the cases [5]. In most cases, however, the cyst presents a gradual expansion. Ruptured intracardiac cysts can lead to life-threatening consequences, including: severe anaphylactic shock, tamponade, systemic arterial embolization, acute myocardial infarction, and acute pulmonary hypertension by embolization of several scolices [24].

In the treatment of hydatid disease, surgery is still the preferred method. Despite the use of antihelminthic medicines in the preoperative and postoperative periods, extirpation of the lesion under cardiopulmonary bypass is advised [23].

Conclusion

Cardiac echinococcosis is uncommon. Because of the risk of rupture, its spontaneous course is dangerous. Its clinical signs are diverse, frequently latent, and deceptive. Non-invasive imaging techniques that can reveal certain symptoms greatly aid in the diagnosis. MRI reveals the precise anatomical location and nature of the external and internal structures, whereas CT best reveals the wall calcification.

Authors' contributions

All authors participated to the data collection and interpretation, as well as the writing of the manuscript. The final version of the manuscript has been approved by all of the authors.

Patient consent

An informed consent was obtained from the patient.

REFERENCES

[1] Bronstein JA, Klotz F. Larval cestodoses. Encycl Med Chir, Maladies infectieuses, 8-511-A-12, 2005, 18 p. Doi:10.1016/S1166-8598(05)38390-6.
[2] Pierre Aubry, Bernard-Alex Gaüzère. Hydatidosis or hydatid cyst. Actuality 2019. Updated on 17/12/2019 www.medecinetropicale.com.
[3] Ministry of Health, Department of Epidemiology and Disease Control (DELM). Epidemiological situation of hydatidosis and

activities carried out in 2005 and 2006. Annual activity report - Status of parasitic disease control programs. Years 2005–2006.
[4] Ben-Hamda K, Maatouk F, Ben-Farhat M, Betbout F, Gamra H, Addad F, et al. Eighteen year experience with echinococcosus of the heart: clinical and echocardiographic features in 14 patients. Int J Cardiol 2003;9:145–51.
[5] Oueslati S, Said w, saaidi I, Djebbi M, charrada l, Rezgui L, et al. Imaging cardiac hydatid cysts: 8 cases. La Presse Médicale 2006;35(7–8):1162–6. doi:10.1016/s0755-4982(06)74773-x.
[6] Ghrairi H, Khouadja MA, Abouda M, Ammar J, Hantous S, Kilani T, et al. Hydatid cyst of the heart and vessels, 4 cases. Presse Med 2005;34:101–4 © 2005, Masson, Paris. doi:10.1016/S0755-4982(05)88236-3.
[7] Ben Khalfallah A, Ben Slima H. Cardiac hydatid cyst. Which imaging modality for an accurate diagnosis? Ann Cardiol Angeiol (Paris) 2017;66(2):102–8. doi:10.1016/j.ancard.2016.12.008.
[8] Jerbi S, Kortas C, Dammak S, Hamida N, Ennabli K. Cardiopericardial hydatid cysts about 19 cases Tunis. Medecine 2004;82(Suppl. 1):152–7.
[9] Bouree P, Lancon A. Diagnostic of Blood eosinophilia. Rev FrLab 2000;321:67–71. doi:10.1016/S0338-9898(00)80435-7.
[10] Aubry P. Hydatidosis or hydatid cyst. Med Trop 2013 [Actualités].
[11] Makni F, Hachicha L, Mseddi F, Hammami H, Cheikhrouhou F, Sellami H, et al. Apport of Western blot in diagnosis of hydatidosis. Bull Soc Path Exot 2007;100:171–2173.
[12] Elkarimi S, Ouldelgadia N, Gacem H, Zouizra Z, Boumzebra D, Blelaabidia B, et al. Tamponade reveals an intra-pericardial hydatid cyst–a case report. Ann Cardiol Angeiol (Paris) 2012;63(4):267–70. doi:10.1016/j.ancard.2012.01.003.
[13] Kosecik M, Karaoglanoglu M, Yamak B. Pericardial hydatid cyst presenting with cardiac tamponade. Can J Cardiol 2006;22(2):145–7. doi:10.1016/s0828-282x(06)70254-9.
[14] Ben Khalfallah A. Contribution of transesophageal echocardiography in the diagnosis of hydatid cyst of the heart - Case report. Maghreb Med 1996:305.
[15] Karadede A, Alyan O, Sucu M, Karahan Z. Coronary narrowing secondary to compression by pericardial hydatid cyst. Int J Cardiol 2008;123:204–7. doi:10.1016/j.ijcard.2006.11.174.
[16] El Majhad, Lachhab A, Cherradi R, Srairi J, SrairiDoghmi NN, et al. Contribution of magnetic resonance imaging (MRI) in the diagnosis of cardiac hydatid cyst. Eastern Mediterranean Health Journal 2011;17(12):996–1000.
[17] Kharras Abdennassar El, Atmane Mehdi, Fenni Jamal El, Chaouir Souad. Cardiac and renal hydatid disease - contribution of imaging: report of a case. Pan Afr Med J 2014;18:153. doi:10.11604/pamj.2014.18.153.2410.
[18] Atalar MH, Cankorkmaz L, Köylüoğlu G, Şalk I. Imaging characteristics of three primary muscular hydatid cyst cases with various patterns. Kafkas J Med Sci 2012;2(2):74–7. doi:10.5505/kjms.2012.76486.
[19] Stojkovic M, Rosenberger KD, Kauczor HU, Junghanss T. Diagnosing and staging of cystic echinococcosis : how do CT and MRI perform in comparison to ultrasound? PLoS Neg Trop Dis 2012;6(10):e1880. doi:10.1371/journal.pntd.0001880.
[20] Polat P, Kantarci M, Alper F, Suma S, Koruyucu MB, Okur A, et al. Hydatid disease from head to toe. Radiographics 2003;23:475–94 quiz 536–537.Jouhadi Z, Ailal F, Dreoua N, et al. Kyste hydatique cardiaque. Deux observations chez des enfants. Presse Med 2004;33:1260–3.
[21] Onursal E, Tireli E, Tansel T, Dindar A, et al. Surgical treatment of cardiac echinococcosis: report of eight cases. Surgery Today 2001;31(4):325–30.
[22] Ben Hamda K, Maatouk F, Ben Farhat M. Eighteen year experience withechinococcosis of the heart: clinical and echocardiographic features in14 patients. Int J Cardiol 2003;91:145–51. doi:10.1016/S0167-5273(03)00032-9.
[23] Memduh Dursun, Ege Terzibasioglu, Ravza Yilmaz, Bledi Cekrezi, Seref Olgar, Kemal Nisli, et al. Cardiac hydatid disease. CT and MRI findings 2008;AJR:190.
[24] Isil Pakis, Elif Ulker Akyildiz, Ferah Karayel, Arzu Akcay Turan, Berna Senel, Mehmet Ozbay, et al.Sudden Death Due to an Unrecognized Cardiac Hydatid Cyst: Three Medicolegal Autopsy CasesApril 2006 Journal of Forensic Sciences 51(2):400-2, DOI:10.1111/j.1556-4029.2006.00056.x.