Unusual presentation of more common disease/injury

Cardiac hydatidosis presenting as an acute coronary syndrome

Guruprasad Sogunuru,¹ Murty DS,² Viswanatha Reddy Chinta,³ Kishan Vuddanda,⁴ Nagabhishek Moka⁵¹ Department of Cardiology, DBR Hospitals, Tirupathi, India² Department of Microbiology & Immunology, SV medical college, Tirupathi, India³ Department of Internal Medicine, Seton Hall University, Trenton, NJ⁴ Department of Internal Medicine, S.V.R.R.G.G.H, Tirupathi, India⁵ Department of Internal Medicine, S.V.R.R.G.G.H, Tirupathi, India

Correspondence to Viswanatha Reddy Chinta, drvisu3@gmail.com

Summary

A 56-year-old man presented as an acute coronary syndrome. A transthoracic echocardiography (TTE) performed to assess left ventricular (LV) function revealed multiple hydatid cysts in the right ventricular cavity compressing the interventricular septum. CT scan for chest and abdomen revealed similar cysts in right-lung apex and left lobe of liver. A polyvisceral involvement in the setting of multiple cardiac cysts suggested cardiac hydatidosis as the most probable diagnosis. CT coronary angiography was normal. A preoperative oral albendazole therapy was initiated. Later the patient underwent elective surgery, 'Evacuation of RV Hydatid Cysts and Obliteration of Cavity with Bovine Pericardium'. His postoperative recovery was good. Regular exercise, chest physiotherapy, a life-long anticoagulation therapy and antibiotic prophylaxis for invasive procedures were recommended. Patient was scheduled for regular follow-up, to check for any recurrences or late complications.

BACKGROUND

We report here an interesting case of cardiac hydatidosis presenting as an acute coronary syndrome (ACS). The case reported here is of particular interest because cardiac hydatidosis itself is a rare entity; its location in the right ventricular apex and its presentation as an ACS is still very rare. In fact, there are very few case reports in the literature regarding cardiac hydatid cyst presenting as an ACS. It also depicts how interpretation of electrocardiograph (ECG) alone can mislead us while making a final diagnosis. It also emphasises the role of early echocardiography in a suspected case of an ACS before planning revascularisation. In addition, it highlights the role of parasitic infections in cardiac emergencies more so in tropical countries.

CASE PRESENTATION

A 56-year-old man presented with rest angina and class IV dyspnea of 2 days duration. No other conventional cardiovascular risk factors were present. His pulse rate was 80 bpm, blood pressure was 100/76 mm Hg and oxygen saturation was 98% on ambient air. Heart sounds were diminished, and lungs were clear on auscultation. Initial ECG revealed left bundle branch block (LBBB) (figure 1). History, physical examination and ECG findings suggested a probable diagnosis of ACS.

INVESTIGATIONS

Cardiac troponins were negative. Chest x-ray was normal.

A transthoracic echocardiography (TTE) was performed to assess the left-ventricular (LV) function. To our surprise, it revealed multiple, well-defined, cystic lesions consistent with hydatid cysts seen as a cluster in the right ventricular (RV) cavity and as compressing the interventricular septum (IVS) (figure 2). These cystic lesions were compromising the LV cavity. However, LV function was normal without any regional wall-motion abnormality.

CT scan of chest and abdomen revealed similar cysts in the right-lung apex and left lobe of liver. Therefore, a polyvisceral involvement in the setting of multiple cardiac cysts suggested cardiac hydatidosis as the most probable diagnosis.

CT coronary angiography revealed no involvement of coronaries.

Subsequent ECGs revealed narrow QRS complexes, ST depression and T-wave inversions in anterior and inferior leads.

TREATMENT

The patient was advised surgery, and a preoperative oral albendazole therapy was initiated at 400 mg twice daily for 2 weeks.

Figure 1 Electrocardiograph showing sinus rhythm with wide QRS complexes (164 msec) suggestive of left bundle branch block.

Figure 2 Transthoracic echocardiography: apical four-chamber view showing multiple cystic lesions in the RV chamber compressing the IVS and compromising the LV cavity

Later he underwent elective surgery, 'Evacuation of RV Hydatid Cyst and Obliteration of Cavity with Bovine Pericardium'.

Under general anaesthesia, median sternotomy was done. Cardio pulmonary bypass (CPB) was established with aortic and bicaval cannulation. SVC and IVC were snared. Hypertonic saline was instilled to minimise the risk of dissemination in case of an accidental spillage of hydatid fluid. Six hydatid cysts of about 4–6 cm diameter were removed surgically (figure 3). The cysts show an outer hyaline that was white in colour – the ectocyst. Cavity was packed with bovine pericardial patch and edges were over sewn. One mediastinal chest-drainage tube was placed. Chest was closed in layers after securing haemostasis.

Following surgical removal of the cysts, the hydatid cyst fluid was centrifuged and examined under microscope. It revealed brood capsules and protoscolices that constitute the hydatid sand. The protoscolex is round to oval in shape, measuring about $140 \times 80 \mu\text{m}$ in size and shows hooklets. Both invaginated (figure 4A) and evaginated (figure 4B) protoscolices were found.

OUTCOME AND FOLLOW-UP

His postoperative recovery was good without any complications

Regular exercise, chest physiotherapy, a life-long anticoagulation therapy and antibiotic prophylaxis for dental and other invasive procedures was advised

Patient was scheduled for a regular follow-up once every 3 months over a period of 1 year, in order to check for any recurrences or late complications.

DISCUSSION

Cystic hydatid disease is a parasitic infestation by helminthes of *Echinococcus* species, that is, *Echinococcus granulosus* and less frequently *Echinococcus multilocularis*. Human (intermediate host) infection results from accidental ingestion of their ova in the form of food or water contaminated with canine (definitive host) feces. The larvae hatch in the duodenum and from there reaches to liver, lungs, heart and systemic circulation¹ and develop into hydatid cysts. The cyst grows slowly but continuously at a rate of 1 to 5 cm a year. The cysts of *E granulosus* have an outer hyaline ectocyst and inner endocyst. The endocyst is the germinal layer that produces ectocyst, hydatid fluid and brood capsules. Several protoscolices develop in the brood capsule. Sometimes, the cysts may be sterile. In contrast, the hydatid cyst of *E multilocularis* is multilocular and lacks hyaline membrane with little or no hydatid fluid. The cysts are generally sterile in humans.

Cardiac hydatidosis accounts for 0.5% to 2% of all hydatid diseases.² The reason for this rare occurrence appears to be the cardiac contractions that provide resistance to the presence of viable cysts.³ It can occur in any part of the heart, left ventricle being the most common site (75%), followed by the RV (15%), inter ventricular septum (5–9%) left atrium (8%), pericardium (8%), pulmonary artery (7%) and right atrium (3–4%).⁴

Clinical manifestations are seen in less than 10% of the cases and, if present, depend on the location, size and integrity of the cyst.¹ Chest pain is the most common symptom.¹ IVS cysts (very rare) may present with arrhythmias, conduction blocks or ventricular outflow tract obstruction. Other

Figure 3 Gross appearance: hydatid cysts with white hyaline ectocyst.

Figure 4 Lactophenol cotton blue for wet mount preparation showing the protoscolices from the hydatid sand: invaginated (A) and evaginated (B) scolices.

manifestations include ACS, valvular dysfunction and so on.^{1 5 6} There are very few case reports of hydatid cyst presenting as an ACS. Most of them are either pericardial cysts compressing coronaries or ruptured cysts.^{7 8} The case

reported here is of particular interest because its presentation as an ACS may misdirect diagnosis and its recognition, which is important in planning therapeutic strategies. Treating the patient with inappropriate medication may

expose him to life-threatening complications like rupture of the cyst leading to anaphylaxis, embolisation of cyst contents in to pulmonary or systemic circulation, pericardial tamponade, sudden cardiac death and so on.

The chest radiograph can often appear normal, as was the condition in the present case.

Electrocardiographic changes also depend on location, size and integrity of the cyst. These include ischemic changes (ST depressions and T wave inversions) and conduction disturbances (atrioventricular nodal blocks, bundle branch blocks) as observed in the present case. Other changes include arrhythmias and sudden cardiac arrest.^{6,9,10} However, none of the above changes is characteristic of hydatid cyst. Therefore, a cautious interpretation of electrocardiographic changes always with the aid of a bedside echocardiography is necessary, especially in the setting of a stable ACS.

Echocardiography is the diagnostic investigation of choice for all cases of cardiac hydatid cysts.^{1,10} Apart from its non-invasive nature, widespread availability, cost-effectiveness, easy bedside assessment, its potential advantages include accurate differentiation of a solid mass from a cystic lesion; determination of number, location, size and integrity of cysts; and demonstration of thin membranes of daughter cysts and hydatid sand in a multiloculated cystic lesion. It also helps to determine the haemodynamic effects of cysts on the heart.^{10,11} The present case scenario highlights how an early echocardiography unmasked a very rare disease like hydatid cyst, which is a tough clinical diagnosis to make out in a patient presenting with most commonly encountered disease, that is, ACS. Therefore, in the setting of an ACS, an early echocardiography, apart from assessment of LV function, will also help us recognize rare entities like cardiac tumours, aneurysms, cysts (hydatid cysts) and so on.

CT and MRI are the other non-invasive diagnostic modalities but are not superior to echocardiography due to the presence of cardiac-motion artefacts and lack of bedside assessment.¹¹ Nevertheless, CT is helpful in determining polyvisceral involvement, especially when lung parenchyma is involved.

Coronary angiography (conventional/CT) studies should be carried out to evaluate the coronary vessels in all patients with symptoms or when electrocardiographic abnormalities are present as in our case.¹²

Even though serological tests like Casoni's intradermal test and ELISA are available, accuracy of these tests depends on several factors, including type and quality of antigen used. Many false-positive and false-negative results were observed in the past. Therefore, their role is limited to supplement the radiological diagnosis.¹³

Once the diagnosis of cardiac hydatidosis is made, surgery is the definitive mode of treatment to prevent complications. A preoperative albendazole therapy was initiated in our patient to prepare for possible cyst rupture and dissemination of daughter cysts during the surgical procedure. Intraoperative echocardiography gives a definitive

diagnosis and can help in planning the surgery by aiding identification of the cannulation site and in making decisions such as whether to use CPB or to perform the surgery on a beating heart or under cross-clamp.¹² In the present case, we performed the surgery under CPB. We can never be careful enough because complications may arise during surgery from rupture of cystone and one must be prepared to handle them.

Learning points

- In the setting of an acute coronary syndrome, apart from ECG, an early bedside echocardiography may help in recognising rare etiological entities like cardiac cysts and tumours
- A polyvisceral involvement in the setting of multiple cardiac cysts is always suggestive of cardiac hydatidosis
- In cardiac hydatidosis coronary angiography (conventional/CT) studies should be carried out to evaluate the coronary vessels in all patients with symptoms or when electrocardiographic abnormalities are present
- Surgery is the definitive mode of treatment for cardiac hydatidosis

Competing interests None.

Patient consent Obtained.

REFERENCES

1. **Miralles A**, Bracamonte L, Pavie A, *et al*. Cardiac echinococcosis. Surgical treatment and results. *J Thorac Cardiovasc Surg* 1994;**107**:184–90.
2. **Dighiero J**, Canabal EJ, Aguirre CV, *et al*. Echinococcus disease of the heart. *Circulation* 1958;**17**:128–31.
3. **Kanadasi M**, Demirtas M, San M, *et al*. Mobile right atrial hydatid cyst with multiorgan involvement. *Catheter Cardiovasc Interv* 2000;**49**:204–7.
4. **Kaplan M**, Demirtas M, Cimen S *et al*. Cardiac hydatid cysts with intracavitary expansion. *Ann Thorac Surg* 2001;**71**:1587–90.
5. **Perez-Gomez F**, Duran H, Tamames S, *et al*. Cardiac echinococcosis: clinical picture and complications. *Br Heart J* 1973;**35**:1326–31.
6. **Calamai G**, Perna AM, Venturini A. Hydatid disease of the heart. Report of five cases and review of the literature. *Thorax* 1974;**29**:451–8.
7. **Karadede A**, Alyan O, Sucu M, *et al*. Coronary narrowing secondary to compression by pericardial hydatid cyst. *Int J Cardiol* 2008;**123**:204–7.
8. **Telli HH**, Durgut K, Temizhan A, *et al*. Ruptured cardiac hydatid cyst masquerading as acute coronary syndrome: report of a case. *Surg Today* 2001;**31**:908–11.
9. **Vestri A**, Nigri A, Massi L, *et al*. Electrocardiographic picture of myocardial infarct during echinococcosis of the heart. *Boll Soc Ital Cardiol* 1972;**17**:752–4.
10. **Muthu SK**, Thiagarajan A, Govindarajan S, *et al*. Hydatid cyst of the cardiac interventricular septum: report of two cases. *Br J Radiol* 2007;**80**:e278–82.
11. **Oliver JM**, Sotillo JF, Domínguez FJ, *et al*. Two-dimensional echocardiographic features of echinococcosis of the heart and great blood vessels. Clinical and surgical implications. *Circulation* 1988;**78**:327–37.
12. **Ceviz M**, Becit N, Kötak H. Infected cardiac hydatid cyst. *Heart* 2001;**86**:E13.
13. **Poretti D**, Felleisen E, Grimm F, *et al*. Differential immunodiagnosis between cystic hydatid disease and other cross-reactive pathologies. *Am J Trop Med Hyg* 1999;**60**:193–8.

This pdf has been created automatically from the final edited text and images.

Copyright 2010 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Sogunuru G, Murty DS, Chinta VR, Vuddanda K, Moka N. Cardiac hydatidosis presenting as an acute coronary syndrome. *BMJ Case Reports* 2010; 10.1136/bcr.02.2010.2752, date of publication

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow