Cardiac Hydatid cysts; presentation and management. A case series

Ashur Y. Orahaa, Darya A. Faqeb, Mahmood Kadourac, Fahmi H. Kakamad, Fitoon F. Yaldof, Sabah Qadir Azizb

a College of Medicine, Duhok University, Duhok, Kurdistan, Iraq
b Sulaimani Cardiac Center, Sulaimani, Kurdistan, Iraq
c Duhok Cardiac Center, Duhok, Kurdistan, Iraq
d University of Sulaimani, Old Campus, Sulaimani, Kurdistan, Iraq
e Kscien Organization for Scientific Research, Sulaimani, Kurdistan, Iraq
f Sulaimani Teaching Hospital, Sulaimani, Kurdistan, Iraq

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ABSTRACT

Introduction: Hydatid cyst commonly affects liver and lung. Cardiac Hydatid cyst is an extremely rare disease. The aim of this study is to report the presentation and management of cardiac Hydatid diseases admitted to two major cardiac centers.

Method: A retrospective, case series study, conducted in two centers during two years. Each case presented separately regarding presentation, diagnosis and management.

Results: Four cases have been reported, age ranged from 14 to 42 years with mean age of 24.75 years. Three patients (75%) were male, one patient (25%) was female. Three cases (75%) had history of chest pain, 2 cases (50%) had palpitation, and one case (25%) had nausea, vomiting and fever. Echocardiography was the initial diagnostic test in 2 cases (50%), final diagnostic test in two cases (50%). In 3 cases (75%) the cyst was found in the left ventricle and one case (25%) in right ventricle. Median sternotomy was performed for all cases.

Conclusion: Cardiac Hydatid cyst is a very rare disease. Chest pain is the most common symptom. Surgery is the main modality of treatment.

1. Introduction

Since the era of Galen, hydatid disease was introduced to medicine when Thebesius described this entity in the 17th century. Its origin thought to be in Iceland and to have been brought to continental Europe by dogs accompanying whaleboats in the 18th century [1]. Geographic areas that have highest infestation rates are those in which there is continues contact between humans and certain domestic carnivores such as cats, dogs and some ungulates as sheep [2]. Echinococcosis is endemic to the Mediterranean region, South America, Australia, New Zealand, the Middle East, Alaska, and Canada, where it is widespread among native American tribes [1]. Although no body part can be spared from hydatid cysts (HCs), they mostly affect the liver and lungs [3].

Affectation of bone and muscles (smooth and skeletal muscle) is very rare [2] [3] [4]. Cardiac involvement is much rarer, yet potentially fatal condition and comprises 0.5–2% of all hydatid cases [5] [6]. Any component of the heart is vulnerable to be involved and the presentation depends on the location, size and integrity of the cyst. The myocardium of the left ventricle (LV) is more frequently involved, reaching two-three folds more than the right ventricle (RV) with much less involvement of the interventricular septum. Right and left atria affection is approximately equal. Pericardial involvement occurs mostly in multifocal cardiac echinococcosis.

Solitary pericardial HC is rare [5]. Growth of the cyst leads them being pushed toward a weaker side of the cardiac wall, either the epicardium or the endocardium. LV HCs are usually located subepicardially therefore rarely rupture into the pericardial space. However, if rupture happens, it may be silent or it may cause acute pericardial tamponade, constrictive pericarditis or secondary pericardial cysts [5].

Subendocardial cysts rupture may lead to anaphylactic shock, peripheral, systemic or pulmonary embolization and even sudden death. However it may also be silent. Intracavitary cyst rupture is more frequent in the RV than the LV and can cause pulmonary embolization, pulmonary hypertension and death [5]. The aim of this study is to report the experience of two open heart centers regarding cardiac HC. The work has been presented in line with PROCESS guidelines [6].
2. Case series

2.1. First case

A 23-year-old male patient with poor socioeconomic status, complained of nausea and vomiting for three month duration, followed by increasing fever, attacks of dizziness, chest pain and strider for which he visited a physician whom ordered a chest-X-ray for him that showed a cystic lesion suggestive of HC (Fig. 1). Further assessment was done by computed tomography scan (CT-scan) and echocardiography (Echo) (Figs. 2 and 3). Abdominal Ultrasound was negative for additional HCs. Albendazole therapy (10 mg/kg) was initiated and the patient was scheduled for operation, the strider improved. The patient was admitted to the governmental hospital in preparation for operation (monitoring vital signs and checking blood sugar).

Median sternotomy was performed, there was adhesion between the pericardium and heart, two cysts were found, one on the right side of the ascending aorta and the other in left posterolateral wall of the heart. The aortic cyst was excised followed by initiation of cardiopulmonary bypass and excision of the cardiac cyst thereafter Figs. 4 and 5).

The patient was sent home uneventfully at sixth postoperative day. The operation was supervised by the first author.

2.2. Second case

A 14-year-old boy presented with palpitations, for which he visited a pediatric cardiologist who performed an Echo for him which showed an interventricular septal cystic lesion suggestive of HC. The patient was admitted to governmental hospital, and optimized ((monitoring vital signs and checking blood sugar) for urgent operation. Operative access was through median sternotomy, the cyst was bulging from the RV wall, after initiation of cardiopulmonary bypass, the cyst was excised followed by pericystectomy. The patient left the hospital

Fig. 1. Chest x-ray of the first case showing round, smooth outline lesion at the left side of heart (white arrow). There is smooth outline bulging at the right side of heart (black arrow).

Fig. 2. Computed tomography of chest of the first case, cross sectional image. Round, wall enhancing, partially calcified lesion involving the right side of ascending aorta.

Fig. 3. Computed tomography of chest of the first case, cross sectional image. Round, septated, wall enhancing lesion involving left side of heart.

Fig. 4. Intra operative image of the first case, excision of the aortic cases.

Fig. 5. Intra operative finding of the first case. Intact Hydatid cyst bulging from the left side of left of left ventricle (white arrow).
uneventfully at sixth post operative day. The operation was supervised by the third author.

2.3. Third case

A 42 year-old woman with poor socioeconomic status, presented with chest pain, mild in nature, radiated to the left arm, associated with shortness of breath and palpitations. Chest-X-ray and Echo showed HC in the apex of heart and in left lower lobe. The patient was admitted to the governmental hospital and optimized (monitoring vital signs and checking blood sugar) for operation. Operative access was through median sternotomy and cardiopulmonary bypass. Removal of both cardiac and pulmonary HGs was performed. The patient was discharged from the hospital uneventfully at sixth postoperative day. The operation was supervised by the second author.

2.4. Fourth case

A 20-year-old lady diagnosed by chest CT-scan, Echo and abdominal ultrasound as malignant hydatidosis (multiple HCs involving liver, spleen, lung and heart- LV). She was scheduled for operation. Because of limitation of the resources and overcrowding of the operative list in the governmental hospital, the patient was not admitted. We were informed that the patient developed sudden attack of loss of consciousness and deterioration of condition leading to patient death in emergency hospital. The family did not accept postmortem examination to diagnose the cause of the death accurately. The patient’s management was supervised by the third author.

3. Discussion

Cardiac HC can simulate a silent bomb, therefore it should be managed urgently to avoid catastrophic events. In endemic areas, suspicious cystic lesions should be dealt with carefully and rapid diagnosis should be made using different imaging modalities followed by early pharmacological and surgical management [7]. Increased awareness is essential, amongst cardiac physicians and diagnosticians. Miuti and associates reported an 18-year-old female found dead with negative past medical and surgical history, at autopsy, the HC was found at the LV wall ruptured into the LV chamber [8]. In this study, one case (25%) developed loss of consciousness and subsequent death waiting for operation. The fact that we lost one of our patients confirms the serious nature of this entity. Cardiac involvement is a rare variant and accounts for 0.5–2% of all hydatid disease. As discussed above, Solitary cardiac HCs can have two extremes either remain asymptomatic over long periods, or be discovered after serious and even fatal complications.

The utmost life threatening complication is still rupture that may result in cardiac tamponade, anaphylactic shock, systemic or pulmonary embolism, chest pain, valvular regurgitation, and-in exceptional cases - arrhythmias [9]. In this series, 3 cases (75%) had history of chest pain, 2 cases (50%) had palpitation, and one case (25%) had nausea, vomiting and fever. Shortness of breath was present in one case (25%). Cardiac HC most commonly involves the LV (55–60%), probably because of the its large myocardial mass and blood supply. Left ventricle HC can mimic LV aneurysm and it should be one of differential diagnosis of cystic cardiac lesions in endemic areas.

Besides, other portions of the heart can be involved. Structures like RV is involved in 15%, interventricular septum 5%–9%, and the right atrium could be involved in 3%–4% of cases [10]. In this series, in 3 cases (75%) the cyst was found in the LV, one case (25%) in RV, and in one case (25%) there was multiple cysts scattered all over the heart, liver and lung. Regarding methods of diagnosis, high index of suspicion is crucial especially in endemic areas. As an efficient, easy-to-perform, informative, and highly sensitive noninvasive technique to localize and detect the cyst before surgery, Echo is the diagnostic method of choice for cardiac HC [11]. In the current series, Echo was the initial diagnostic test in 2 cases (50%), final diagnostic test in two cases (50%), the initial diagnostic test was chest-X-ray and confirmed and localized by CT-scan in one case (25%).

There are controversies regarding preoperative anthelmintic chemotherapy in case of cardiac HC [12,13]. Macedo et al. reported an 11-year-old boy with HC of RV wall, they did not give preoperative chemotherapy and put the patient on Albendazole for 12 months post-operatively [12]. On the other hand, Watermark and colleagues reported a very good response when they put their 87-year-old patient on 10 mg/kg for 6 months, because he was unfit for general anesthesia [13]. In this study, one patient had strider with right side ascending aorta HC and responded well to albendazole therapy prior to surgery, this may show the role of chemotherapy in adjunct to surgery. There are several limitations to this study. First, the sample size is small. Second, the study design is retrospective case series; this has led to missing of important data. Third, absence of standard guidelines of management made variation in treatment strategy regarding time of operation, hospital admission and optimization.

4. Conclusion

Cardiac HC is a very rare disease, mostly affecting LV, chest pain is the most common symptom. Surgery is the main modality of treatment. Little is known about clinical course and outcome of cardiac HC, further studies are necessary.

Ethical approval

Approval has been taken from Sulaimani university ethical committee.

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Author contribution

Ashur Y. Orah, Darya A. Faqe, Mahmood Kadoura: surgeons performing the operation. Final approval of the manuscript.

Fahmi H. Kakamad, Fitoon F. Yaldo, Sabah Qadir Aziz: drafting the manuscript, collecting the data, final approval of the manuscript.

Conflicts of interest

There is no conflict to be declared.

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