Giant hydatid cyst of interventricular septum of heart

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Received: 29 June 2019 / Revised: 13 August 2019 / Accepted: 14 August 2019 / Published online: 10 September 2019
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Introduction

Hydatid disease is a zoonotic infection caused by the metacestode stage of *Echinococcus granulosus*, *E. multilocularis*, or *E. vogeli* (Taeniidae family). Dogs and cats are the primary carriers of this parasite. Humans can be infected as intermediary carriers after ingestion of the parasite eggs in unwashed or uncooked vegetables [1, 2]. Solitary cysts occur in almost 60% of the cases [3].

Cardiac involvement is seen in only 0.5 to 2% of patients with hydatid disease [4–6], and the location of a hydatid cyst in the interventricular septum is just 4% of cardiac cases [4–6].

The diagnosis is by clinical suspicion, relevant serological tests, and cardiac imaging by various modalities like echocardiography which is highly sensitive and specific in the diagnosis of hydatid cysts [1].

Herein, we report a case of a giant cardiac hydatid cyst involving the interventricular septum and its surgical management.

Case report

A 55-year-old female patient was admitted to our hospital with chief complaints of dyspnea. Physical examination revealed that the cardiac apex was shifted to the left. Routine laboratory test results were normal. Transthoracic echocardiography revealed a huge hydatid cyst (9.5 × 9.0 cm) occupying the entire left ventricular cavity (Fig. 1). To further characterize the lesion, magnetic resonance imaging (MRI) was done which

revealed echinococcosis of the interventricular septum causing compression of the left ventricular cavity (Fig. 2).

A surgical excision of the cyst was planned. After a midline sternotomy, cardiopulmonary bypass (CPB) was established using standard cannulation techniques. Right atriotomy was done after caval snares and a bulge was seen in the interventricular septum just beneath the tricuspid septal leaflet. Pericardial cavity was packed with scolicedal-soaked towels. A transverse incision was made in the septal wall of the right ventricle and the cavity opened (Fig. 3). The cysts were enucleated carefully, taking care not to spill its contents (Figs. 4 and 5). The cavity was washed with hypertonic saline and obliterated using running polypropylene sutures. The right atrium was closed and patient was weaned off bypass successfully.

Discussion

Within the heart, the most frequent location is the ventricular myocardium and is usually sub-pericardial. Hence, they rarely rupture in the pericardial space [3]. The left ventricle (55–60%) is damaged twofold to threefold more frequently than the right [3] because this chamber of the heart has the maximum myocardial mass and blood supply [7]. When the left ventricle is involved, the hydatid cyst can mimic left ventricular aneurysm [8] which can be differentiated by coronary angiography [6]. The right ventricle is involved in 15% and the right atrium may be involved in 3 to 4% of cases [7–9]. The low incidence of the disease involving the heart is because contractions of the heart provide a natural resistance to the presence of viable hydatid cyst. However, when this mechanism fails the parasite can invade the myocardial tissue [10]. Initially, the cyst grows slowly between the cardiac fibers and causes no sign or symptom. As it gradually progresses, there will be onset of symptoms like dyspnea and pericardial pain.

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Fig. 1 2D echo with color Doppler showing multiple cysts inside the LV cavity

The cyst will eventually invade the surrounding structures, obstruct the blood flow, and also invade the conductive system of heart when it involves the interventricular system causing symptoms due to compression of the conduction pathway like atrioventricular block, syncope attack, and obstruction of the right or left ventricular outflow tract. It can mimic acute coronary syndrome when the cysts grow towards the epicardium and compress the small coronary arteries, disturbing blood flow [2].

The most important major complication is the rupture of the cyst which is common in right heart cyst [9] which can trigger anaphylactic shock or tamponade, systemic or pulmonary embolization, and compression of coronary branches [4]. After cyst perforation three-quarters of the patients die from septic shock or embolic complications [6].

The diagnostic approach of echinococcosis in the heart is based on serological reactions, echocardiography, chest X-ray, computerized tomography, and/or magnetic resonance imaging.

Surgery is the definitive therapy for cardiac hydatid disease and is associated with a high recovery rate [6].

Scolicidal solutions such as iodine, ethanol, methylene blue, or hypertonic saline can be used to reduce the risk of leakage of fluid from cyst during cardiac surgery [10]. Germicide must not be administered before surgical removal as it leads to cyst death and destruction of its wall which will result in cyst rupture and its complications [3]. Albendazole therapy (400 mg twice daily) is typically prescribed for at least 4 days preoperatively and for 4 to 12 weeks postoperatively [4].

Conclusion

Cardiac hydatid disease is a rare entity and can also prove to be a fatal disease. Hence, a timely and accurate diagnosis by routine laboratory investigations, serological tests, and imaging modalities like echocardiography, computed tomography, and magnetic resonance imaging is essential. The treatment regimen involves surgical enucleation, use of scolicide agent in the cavity, and concurrent albendazole therapy. Education about hygiene and healthy practices with pets can reduce the burden of this disease.

Fig. 2 Cardiac MRI showing multiple hydatid cysts in the interventricular septum

Fig. 3 Intraoperative picture after opening of the right atrium and incising septal wall. Arrow shows daughter cysts

Fig. 4 Cysts being carefully removed

Fig. 5 The quanta of cysts removed

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Informed consent Informed consent was obtained from the participant.

Ethical clearance Not applicable.

Human and animal rights Not applicable.

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