

Hydatid cyst of the cardiac interventricular septum with complete atrioventricular block: a case report from Pakistan

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Abstract

Cardiac involvement in systemic echinococcosis is a rare phenomenon. Abnormalities of the cardiac conduction system are an exceptional feature of cardiac hydatidosis. We report, to the best of our knowledge, the first case of cardiac hydatidosis from Pakistan in a 30 year old male who presented with recurrent syncopal episodes due to complete atrioventricular conduction block and subsequently underwent implantation of dual chamber pacemaker. His transthoracic echocardiogram revealed a large, well circumscribed, interventricular septal mass which was avascular on subsequent perfusion imaging. Surgical resection of the mass three years later confirmed it to be a hydatid cyst.

Keywords: Hydatid cyst, Hydatidosis, Atrioventricular block, Interventricular septal mass, Pakistan.

Introduction

Echinococcus infection of the heart is quite infrequent accounting for only 0.5-2% of all cases of human hydatidosis.¹ Involvement of the conduction system leading to complete atrioventricular block is a further rarity previously documented in a few case reports.²⁻⁶ To our knowledge, this is the first documented case of cardiac hydatidosis from Pakistan.

Case Report

In July 2008, a 30 year old Pakistani male presented to our emergency room with repeated episodes of transient loss of consciousness for eight months with increased frequency over last twenty four hours. The patient had recently arrived from the Middle East and had no notable medical history except antiepileptics intake for the above complaint prescribed by a general physician. He was a non smoker with no history of substance abuse.

On examination, his heart rate was 30 per minute with a blood pressure of 110/60. On cardiac auscultation, a low pitched 2/6 systolic murmur was audible at left lower sternal border with no radiation and clear lung fields. His electrocardiogram showed complete heart block and he underwent emergent temporary pacemaker insertion followed by a dual chamber permanent pacemaker implantation the next day. His transthoracic echocardiogram (Figure-1)

revealed a 43x39 mm well demarcated round echo dense mass in basal interventricular septum with equal protrusion into both ventricles but no outflow tract obstruction. No valvular regurgitation was noted. Subsequent Technitium-99m sestamibi single-photon emission computed tomography (SPECT) study showed no tracer uptake in the mass. Surgical resection was planned, however, it was deferred due to patient's financial constraints and non consent for surgery. Serological testing for Echinococcus was recommended but patient did not comply. Thereafter, yearly echocardiographic evaluation done over the next three years showed no change in the dimensions of the mass. The patient remained symptom free and pacemaker dependent throughout. Finally the patient consented for surgery in June 2011 and was operated using cardiopulmonary bypass technique with cold blood cardioplegia. A 5.0 x 4.0 x 2.5 cm light brown irregular growth of membranous interventricular septum involving tricuspid chordae was excised followed by tricuspid chordae reattachment and surgical VSD closure under intra-operative transesophageal echocardiographic guidance.

Despite coming off cardiopulmonary bypass without any problems, the patient suffered massive distributive shock



Figure-1: Transthoracic echocardiogram showing a 41x39mm basal IVS mass with protrusion into both ventricles. (LA: left atrium, LV: left ventricle, RA: right atrium, RV: right ventricle).

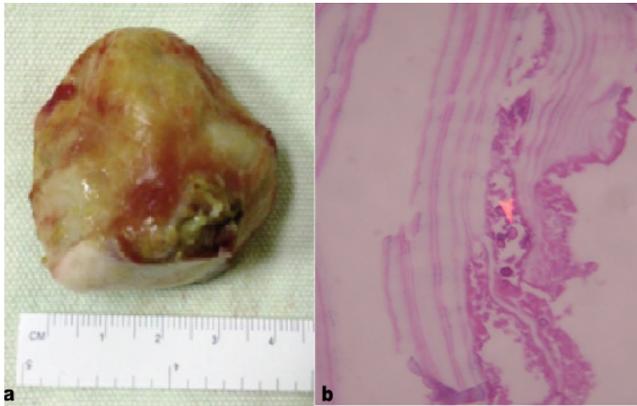


Figure-2: a) Encapsulated and necrotic nodular mass after excision. b) necrotic slough in the lumen and calcified protoscolices (arrow head).

soon after the surgery with recurrent episodes of ventricular fibrillation and underwent prolonged open cardiac massage. Pacemaker interrogation post extensive cardiopulmonary resuscitation did not reveal any dysfunction. Patient remained in vegetative state for four days post operatively. His computed tomography (CT) brain showed extensive cerebral oedema and electroencephalography revealed evidence of irreversible anoxic brain injury. After discussion with the family, mechanical support was withdrawn and the patient died soon afterwards. Post operative gross and histopathological examination of the excised mass revealed classical features of hydatid cyst (Figure-2: a&b).

Discussion

Human hydatidosis is a tissue infestation caused typically by larva of canine tapeworm *Echinococcus granulosus*.¹ In addition, *Echinococcus multilocularis* and *Echinococcus vogeli* have also been reported.⁷ Most often, sheep is the intermediate host and the dog the definitive host, humans serve as common accidental host.⁸ Most infections arise from handling dogs or ingestion of faecal contaminated food items.⁷ Although human hydatidosis has been reported in the West, most cases come from inhabitants of World Health Organization (WHO) defined endemic areas.⁷

Cardiac involvement in echinococcosis is rare, with an incidence of 0.5-2% of all cases of human hydatidosis.¹ 55-60% of cardiac hydatidosis are limited to the left ventricle followed by right ventricular involvement in 15% cases, interventricular septum infestations are reported in 5-9% cases with right atrial involvement in 3-4%.⁸

Clinical presentation of cardiac Echinococcosis depends on the size and site of infestation. Compressive

symptoms causing low cardiac output, ventricular outflow tract obstruction along with nonspecific features of weight loss, dyspnoea and fever have been reported.¹ Rarely, interventricular septal hydatidosis leads to conduction defect, as in our case.²⁻⁶ Far lethal outcomes of thromboembolism and/or anaphylactic shock have also been reported in cases of cardiac cystic rupture, which is as common as 39%.¹

Although serological markers of *Echinococcus* are helpful, two-dimensional echocardiography remains the diagnostic utility of choice for cardiac hydatid cyst.⁷ Newer emerging techniques of cardiac Magnetic Resonance Imaging (MRI) and transthoracic CT have reported excellent diagnostic yields as well, with additional benefit of transthoracic screening for other tissue involvement.⁷

Surgical enucleation remains the treatment of choice for cardiac hydatidosis.⁹ However extreme care is to be taken to avoid cystic rupture which may result in grave complications, even death. Benzimidazoles as adjunct therapy is indicated for human hydatidosis⁹ and certain cases of cardiac hydatidosis have reported good results of post resection prophylaxis.^{1,3,8}

Echocardiography can distinguish between cystic and solid masses based on echo texture. However, a distinctive feature in our case was that echocardiogram revealed dense texture which was more suggestive of a solid tumour rather than classic echo-lucent space suggestive of a cyst. This unique case exemplifies that hydatid cyst should be kept in the differential diagnosis of a nonvascular intracardiac mass especially if surgical intervention is planned.

References

1. Saad RA, Amer K, Migliore M, Aziz T, Azzu A. Right intraventricular hydatid cyst of the heart. *Asian Cardiovasc Thorac Ann* 2003; 11: 160-2.
2. Ottino G, Villani M, De Paulis R, Trucco G, Viara J. Restoration of atrioventricular conduction after surgical removal of a hydatid cyst of the intraventricular septum. *J Thorac Cardiovasc Surg* 1987; 93: 144-7.
3. Agarwal DK, Agarwal R, Barthwal SP. Interventricular septal hydatid cyst presenting as complete heart block. *Heart* 1996; 75: 266.
4. Bennis A, Darif A, Mehadji BE, Chraibi N. Cardiac hydatid cyst revealed by complete heart block. *Heart Vessels* 2000; 15: 46-8.
5. Mecozzi G, Verunelli F, Mariani MA, Zucchelli G, Grandjean JG. Interventricular hydatid cyst with atrioventricular block: a case report. *Ital Heart J* 2003; 4: 347-9.
6. Yilmaz M, Senkaya I, Kaderli A, Ener S. Complete atrioventricular block due to a hydatid cyst located in the interventricular septum: a case report. *Heart Surg Forum* 2007; 10: E9-11.
7. Brunetti E, Cunha BA. Echinococcosis hydatid cyst. (Online) (Cited 2011 June 21). Available from URL: <http://emedicine.medscape.com/article/216432-overview#showall>.
8. Tetik O, Yilik L, Emrehan B, Ozbek C, Gurbuz A. Giant hydatid cyst in the interventricular septum of a pregnant woman. *Tex Heart Inst J* 2002; 29: 333-5.
9. Leder K. Treatment and prevention of echinococcosis. In: *UpToDate*. Weller PF, ed. UpToDate. Waltham, Mass. (Online) 2010 (Cited 2011 June 21). Available from URL: <http://www.uptodate.com>.