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Case Report

Intramyocardial hydatid cyst revealed with ischemic stroke due to left ventricular systolic dysfunction: A case report ☆,☆☆,★

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ABSTRACT

Cardiac echinococcosis, although rare, presents a range of clinical manifestations depending on the cyst's location within the heart. These manifestations can range from asymptomatic conditions to serious complications such as arrhythmias, valvular dysfunction, cardiac tamponade, heart failure, shock, or even death.

This case report describes the unusual presentation of a young man with an intramyocardial hydatid cyst, which was incidentally discovered following an ischemic stroke. Diagnostic evaluation included echocardiography, as well as chest and abdominal angiography via computed tomography (angio-CT). Surgical intervention was undertaken, involving cystectomy and the removal of the cyst contents. The patient's postoperative recovery was uneventful and favorable.

This report emphasizes important diagnostic and management considerations specific to cardiac hydatid cysts and includes a review of the relevant literature to provide context and depth to our findings.

List of abbreviations: NIHSS, National Institutes of Health Stroke Scale; LV, left ventricular; RV, Right ventricular; AV, atrioventricular; LVD, left ventricular dysfunction.

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Introduction

Hydatid disease, a zoonotic parasitic infection, primarily results from 3 species of the Echinococcus genus: *Echinococcus granulosus, E. multilocularis*, and *E. vogeli*. The primary carriers of these parasites are canines and felines. Humans, serving as intermediate hosts, can acquire the infection through the ingestion of contaminated vegetables or accidental consumption of parasite eggs. Once ingested, parasite embryos penetrate the intestinal wall, entering the circulatory system, and have the potential to affect various organs [1].

The liver is the most common site of infection due to direct access through the portal vein. However, if the liver is bypassed, parasites can reach the lungs via the inferior vena cava and occasionally affect other organs, including the heart. Cardiac involvement in hydatid disease is exceptionally rare, occurring in less than 2% [2–4] of cases.

Diagnosing cardiac hydatid disease requires a high index of clinical suspicion, supplemented by serological tests and cardiac imaging modalities. Echocardiography [5], in particular, stands out for its sensitivity and specificity in identifying hydatid cysts. Positive serological tests further assist in confirming the diagnosis.

Case presentation

The case of the 19-year-old male patient from Fes, Morocco, who presented at the Emergency Room of Hassan II University Hospital with right-sided hemiparesis and aphasia 6 hours prior, reveals a complex medical situation. Despite lacking significant pathological history and having unremarkable family and social histories, his symptoms were concerning. On initial examination, he appeared conscious with stable vital signs, although the National Institutes of Health Stroke Scale (NIHSS) score was notably elevated at 9.

Laboratory findings indicated a slight elevation in white blood cell count but were otherwise within normal limits. However, the significant discovery came from a brain computed tomography (CT) scan, which revealed a subacute infarction in the territories of the left middle cerebral and posterior cerebral arteries (Fig. 1). Thrombolysis was not an option due to delayed admission. Cerebral and cervical angiography failed to identify any vascular abnormalities, ruling out common causes of stroke in young subjects such as carotid dissection (Fig. 2).

Further investigations, including electrocardiogram and echocardiography, were pivotal. Echocardiography revealed left ventricular (LV) dysfunction with a peculiar finding of a large multi-lobular echo-dense mass attached to the posteroinferior wall of the LV. This led to suspicion of a myocardial hydatid cyst, which was confirmed by additional chest and abdominal angiographic computed tomography (angio-CT) scans showing a cystic mass with multiple septa and calcifications in the LV wall (Figs. 3 and 4). Interestingly, serology for hydatidosis returned negative.

The patient underwent surgical intervention, which confirmed the diagnosis of intramyocardial cardiac hydatidosis.

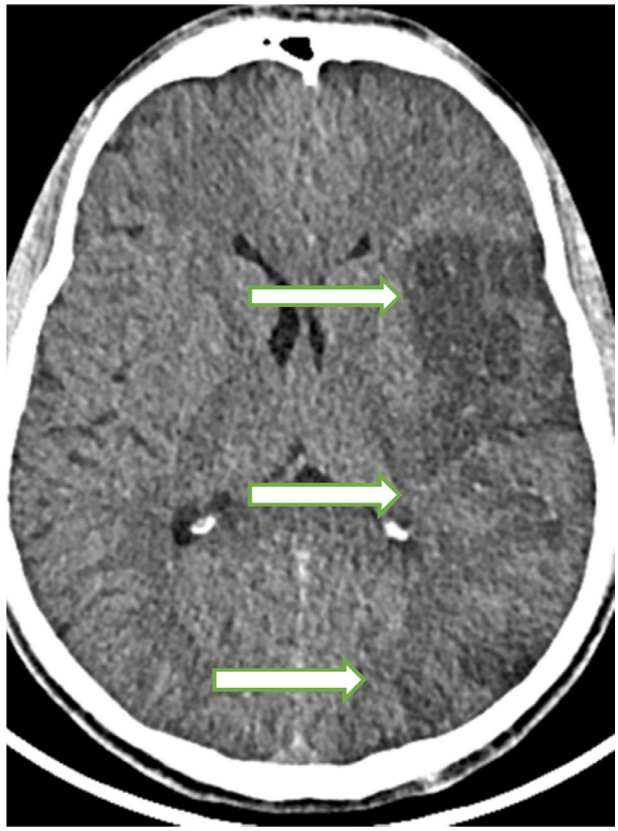

Fig. 1 – Imaging of subacute infarction in the territories of the left middle cerebral and posterior cerebral arteries (white arrow).

The procedure involved cystectomy, leading to favorable postoperative evolution, thus preventing further complications related to this cyst. The patient showed improvement in neurological status following rehabilitation sessions and partial recovery from deficits, reflected in a reduced NIHSS score from 9 to 4. This case underscores the importance of considering uncommon etiologies in stroke presentations, especially in regions endemic to certain parasitic diseases like hydatidosis. Early recognition and intervention are crucial for improved outcomes in such cases.

Cardiac hydatid cysts are an uncommon manifestation of hydatid disease. They are predominantly located in the left ventricular free wall, accounting for 55%-60% of cases. This preference is attributed to the higher myocardial mass and blood supply in this area [6]. The growth of hydatid cysts is typically slow, leading to a prolonged asymptomatic phase. When symptoms do arise, they are often non-specific, such as chest pain, palpitations, or cough [7].

In patients from endemic areas, the diagnosis of cardiac hydatid cysts should be considered, especially in the presence of suggestive symptoms. As the cyst enlarges, it can compress adjacent myocardial tissue, leading to coronary vessel displacement, rhythm disturbances, mechanical interference with atrioventricular (AV) valves, and ventricular dysfunction, as seen in our patient.

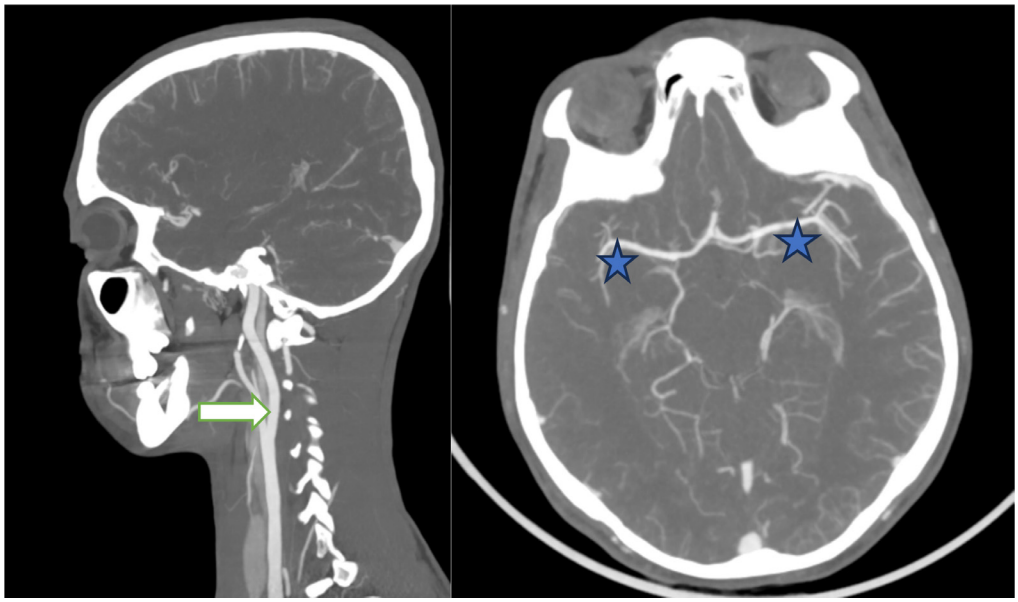

Fig. 2 – Normal cerebral and cervical angiography excluding carotid dissection: normal internal carotid artery(white arrow), patent middle cerebral artery (blue star).

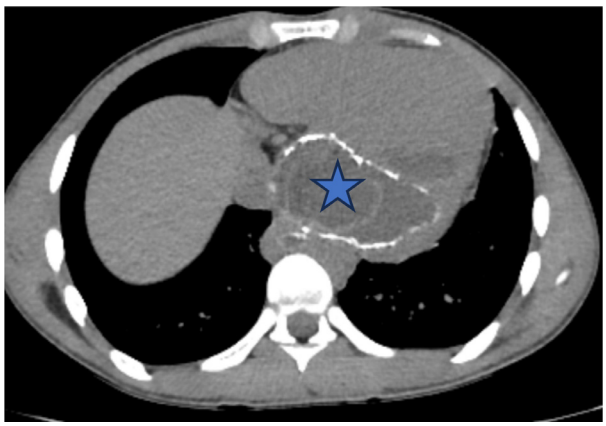

Fig. 3 – Angio-CT of the chest revealing a cystic mass with multiple septa and calcification (blue star) in the postero-inferior wall of the left ventricle, indicative of a myocardial hydatid cyst.

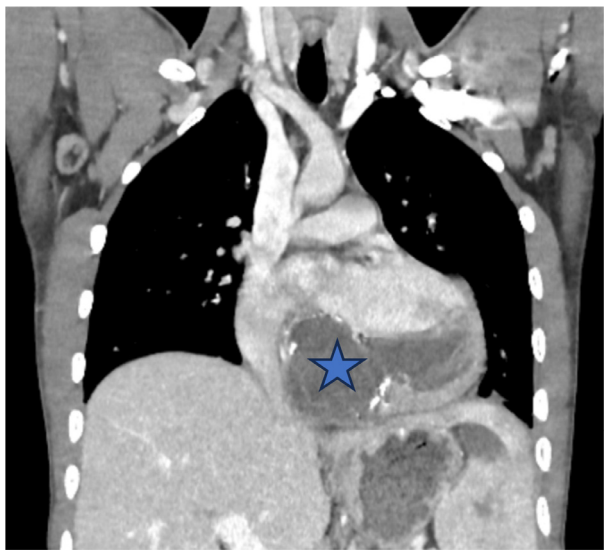

Fig. 4 – Angio-CT of the chest showing a cystic mass with multiple septa and calcification in the postero-inferior left ventricular wall (blue star), suggestive of a myocardial hydatid cyst with concurrent splenic infarction.

Moreover, numerous studies have indicated that left ventricular dysfunction (LVD), irrespective of its severity, is independently associated with an increased risk of ischemic stroke [8]. To the best of our knowledge, this is the first reported case in literature where an ischemic stroke was secondary to sub-clinical left ventricular dysfunction caused by an intramyocardial hydatid cyst.

Echocardiography remains the preferred imaging modality for cardiac hydatidosis, facilitating the identification of cysts, determining their cardiac location, and assessing for potential complications like rupture with pulmonary embolism [9,10]. It allows for the evaluation of both global and regional left ventricular function, including systolic and diastolic functions, and can measure various cardiac parameters such as output, pressures, and left ventricular mass. Regional dysfunction can also be assessed using the wall motion score [11].

While the typical cystic appearance of cardiac hydatid cysts on echocardiography generally makes diagnosis straightforward, differentiating these cysts from myxomas can sometimes be challenging [12,13]. Transesophageal

echocardiography provides more detailed information about these abnormalities [14]. Computed tomography (CT) and magnetic resonance imaging (MRI) can further elucidate the cyst's relationship with surrounding anatomical structures. Angiography and scintigraphy are essential for diagnosing pulmonary hydatid embolism [15].

Cardiac surgery, typically involving cystectomy, is the preferred treatment for most cardiac hydatid cyst cases, although the techniques may vary. The use of scolicidal solutions such as iodine, ethanol, methylene blue, or hypertonic saline is recommended during surgery to minimize the risk of cyst fluid leakage. Postoperative antibiotic therapy duration can vary [16].

Conclusion

This case report underscores the rare but serious complication of ischemic stroke arising from cardiac hydatid cysts. As demonstrated, such cysts, predominantly found in the left ventricular free wall, can lead to significant cardiac complications including left ventricular dysfunction, which increases the risk of ischemic stroke. The crucial role of echocardiography, supplemented by chest and abdominal angio-CT, in the timely diagnosis of cardiac hydatid cysts is highlighted. These imaging modalities not only aid in identifying the cyst but also in evaluating its impact on cardiac function and structure. Early and accurate diagnosis, followed by prompt surgical intervention, is key to preventing life-threatening complications and ensuring favorable outcomes, as evidenced in the case presented. This report adds valuable insight into the rare presentation of hydatid disease and its management, contributing to the broader understanding of its clinical implications.

Ethics approval and consent to participate

Not applicable.

Patient consent

I, the author of the article: Intramyocardial Hydatid Cyst revealed with Ischemic Stroke due to Left Ventricular Systolic Dysfunction: A Case Report approve that the patient gives his consent for information be to published in RADIOLOGY CASE REPORTS.

Consent for publication

Written informed consent was obtained from the patient, and legal guardian for publication of this case report and any accompanying images.

Availability of data and materials

The data sets are generated on the data system of the CHU Hassan II of Fes, including the biological data and the interventional report.

REFERENCE

[1] Dursun M, Terzibasioglu E, Yilmaz R, Cekrezi B, Olgar S, Nisli K, et al. Cardiac hydatid disease: CT and MRI findings. AJR Am J Roentgenol 2008;190(1):226–32 [PubMed] [Google Scholar].

[2] Ibn Elhadj Z, Boukhris M, Kammoun I, Halima AB, Addad F, Kachboura S. Cardiac hydatid cyst revealed by ventricular tachycardia. J Saudi Heart Assoc 2014;26(1):47–50 [PMC free article] [PubMed] [Google Scholar].

[3] Tekbas EO, Tekbas G, Atilgan ZA, Islamoglu Y, Cil H, Yazici M. Left ventricle hydatid cyst mimicking acute coronary syndrome. J Infect Dev Ctries 2012;6(7):579–83 [PubMed] [Google Scholar].

[4] Varela-Duran J. 1, U N Riede Cardiac echinococcosis with pulmonary embolism. *Pathol Res Pract* 1980;170(1-3):252–7.

[5] Canpolat U, Yorgun H, Sunman H, Aytemir K. Cardiac hydatid cyst mimicking left ventricular aneurysm and diagnosed by magnetic resonance imaging. Turk Kardiyol Dern Ars 2011;39(1):47–51 [PubMed] [Google Scholar].

[6] Abtahi F, Mahmoody Y. Myocardial hydatid cyst : an uncommon complication of echinococcal infection. Int Cardiovasc Res J 2008;2(1):58–61 [Google Scholar].

[7] Johnstone MT, Notariani M, Charlamb M. Images in cardiovascular medicine: ventricular tachycardia as a complication of an intramyocardial echinococcal cyst. Circulation 2000;102:123–5.

[8] Hays Allison G, Sacco Ralph L, Rundek Tanja, Sciacca Robert R, Jin Zhezhen, Liu Rui, et al. Left ventricular systolic dysfunction and the risk of ischemic stroke in a multiethnic population. Stroke 2006;37:1715–19.

[9] Hamani A, Kerma A, Zbir E, Khatouri A, Nazzi M. Kyste hydatique du coeur, apport de l'échocardiographie bidimensionnelle: à propos de 2 cas opérés. Arch Mal Cœur Vaiss 1992;85:95–8.

[10] Bashour T, Alalai A, Mason D, Saalouke M. Echinococcosis of the heart: clinical and echocardiographic features in 19 patients. Am Heart J 1996;132:1028–30.

[11] Pinto Fausto J. Echocardiography in left ventricular dysfunction. Ital Heart J 2004;5(6) Suppl 41S–47S.

[12] Jeridi G, Boughzala E, Hajri S, Hediji A, Ammar H. Complicated hydatid cyst of the right atrium simulating myxoma of the tricuspid valve. Ann Cardiol Angeiol (Paris) 1997;46:159–62 9183397.

[13] Bolourian AA. Cardiac echinococcosis presenting as myxoma, report of very rare case. Cardiovasc Surg 1997;5:62–3.

[14] Sabah I, Yalcin F, Okay T. Rupture of a presumed hydatid cyst of the interventricular septum diagnosed by transoesophageal echocardiography. Am Heart J 1998;79:420–1.

[15] Essolaymany Z, Amara B, Khacha A, El Bouardi N, Haloua M, Lamrani MYA, et al. Hydatid pulmonary embolism underlying cardiac hydatid cysts – a case report. Respir Med Case Rep 2023;44:101856. doi:10.1016/j.revmed.2018.10.126.

[16] Esfandiar S, Zeynab Y. Omid rezahosseini cardiac hydatid cyst: a case report. Iran J Public Health 2016;45(11):1507–10.