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Case Report

Hepatic Cystic Echinococcosis with Abscess Formation: A Rare Case Report from Vietnam

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Abstract
Larval forms of *Echinococcus* tapeworm infection (Cystic Echinococcosis - CE) are a zoonosis of major public health relevance. While prevalent in many Asian countries, it is rarely reported in Vietnam. We present a case of a 73-year-old male farmer from rural Bac Ninh Province with a history of close contact with dogs and consumption of raw vegetables. Originally diagnosed with an asymptomatic 40-mm simple hepatic cyst in 2020, he presented in 2025 with high fever and subcostal pain. Imaging (US/CT) and ELISA serology confirmed a suppurated *Echinococcus* sp. cyst (WHO stage CE3a). Notably, laboratory results showed a significant systemic inflammatory response with unusual lymphocytosis. The patient underwent a successful partial left hepatectomy and received adjuvant albendazole therapy. This case underscores the necessity of considering CE in the differential diagnosis of hepatic cysts in non-endemic regions like Vietnam, especially when complicated by abscess formation.

Introduction

Cystic echinococcosis (CE), commonly known as hydatid disease, is a neglected tropical zoonosis caused by the larval stage (metacestode) of the cestode Echinococcus granulosus sensu lato (1). The life cycle of this parasite involves definitive hosts, typically dogs and other carnivores, which harbor the adult tapeworms in their intestines, and intermediate hosts, usually ungulates like sheep and cattle, which develop the larval cysts (2). Humans act as accidental intermediate hosts, becoming infected through the ingestion of embryonated eggs via con-

taminated food, water, or direct contact with infected dogs (3).

Once ingested, the oncospheres penetrate the intestinal mucosa, enter the portal circulation, and primarily migrate to the liver (approx. 70%) and lungs (approx. 20%), where they slowly develop into fluid-filled unilocular cysts (1, 4). These cysts consist of an inner germinal layer that produces larval forms (protoscolices) and an outer laminated layer, often surrounded by a host-derived fibrous capsule (5). While many CE cases remain asymptomatic for years, clinical manifestations arise when the enlarging cyst exerts pressure on adjacent organs or when complications occur, such as rupture into the biliary tract or peritoneum, and secondary bacterial or parasitic suppuration (4,6). Suppuration of a hydatid cyst—transforming it into a parasitic abscess—occurs in 5-40% of cases and represents a marks the progression to an acute inlammatory with high morbidity (4).

Globally, CE remains a significant health burden in pastoral regions of Western China, Central Asia, the Mediterranean, and South America (7, 8). However, in Southeast Asia and specifically Vietnam, the disease is considered extremely rare or under-reported, with most clinicians unfamiliar with its pathognomonic features (9). This lack of epidemiological awareness often leads to CE being misidentified as simple serous cysts or pyogenic liver abscesses (10). Given the increasing movement of people and livestock, and the persistence of traditional farming practices, recognizing CE in non-endemic regions is crucial for preventing life-threatening complications. This report describes a rare case of a superinfected hepatic hydatid cyst in a Vietnamese farmer, highlighting the diagnostic challenges and the necessity of radical surgical intervention.

Case Presentation

This case report was conducted in accordance with the ethical standards of the Military Hospital 103 Ethics Committee. The patient provided written informed consent for the publication of his clinical data and accompanying images. All personal identifiers have been removed to ensure anonymity.

A 73-year-old male farmer living in a rural area of Bac Ninh Province (Vietnam) presented with a cachectic habitus. Epidemiologic history: the family kept dogs with frequent contact; dietary habit of eating raw/undercooked vegetables. In 2020, one cyst was detected in the left hepatic lobe on ultrasound: anechoic, well-demarcated, smooth-margined, thin-walled, without biliary communication, measuring 40 mm; asymptomatic, diagnosed as a simple hepatic cyst, untreated.

In March 2025, the patient developed persistent fever (38–39 °C), weight loss, and marked pain in the left subcostal region, without jaundice, and was admitted to hospital for evaluation and treatment. At the hospital, abdominal ultrasound and computed tomography (CT) revealed in the left hepatic lobe a hypoechoic/fluid-containing lesion, 63×65 mm in size (Fig. 1); showing a thick wall and internal floating membranes (the "water-lily sign"), characteristic of WHO stage CE3a (5, 6).

Laboratory tests showed a marked systemic inflammatory response: White Blood Cell (WBC): 30.2 × 10^9/L. Differential Count: Remarkably, the patient exhibited a predominant lymphocytosis (LYMPH% 60.6%) rather than the typical neutrophilia (NEUT% 34.1%) expected in acute bacterial infections. This atypical response likely reflects the chronic immunomodulatory effect of the *Echinococcus* antigens or a specific host-parasite interaction during the long-term progression of the larval infection. Coagulation profile: Impaired liver function was evident with a prothrombin activity (PT) of 48% (INR 1.71).

Diagnosis was confirmed via ELISA (IgG against *E. granulosus* positive, OD 0.878) and microscopic identification of larval forms

(protoscolices) and hooklets in the aspirated abscess fluid (5)

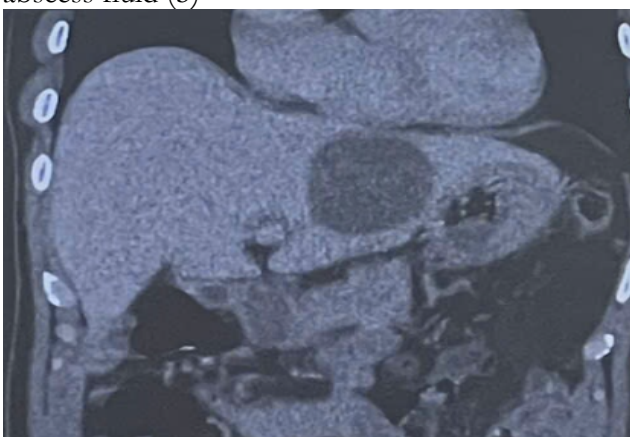

Fig. 1: Imaging of the left-lobe hepatic cyst on abdominal CT.

All images are original and were captured by the authors.

On CT, a cystic lesion in the left hepatic lobe with well-defined margins, an unevenly thickened wall, and intracystic floating membranes, consistent with complicated cystic echinococcosis, classified as cystic echinococcosis stage 3a (CE3a) according to the World Health Organization–Informal Working Group on Echinococcosis (WHO-IWGE) classification (5).

Microscopy showed a thick laminated layer and brood capsules/protoscolex; free hooklets on the wet preparation—highly consistent with cystic echinococcosis (Fig. 2).

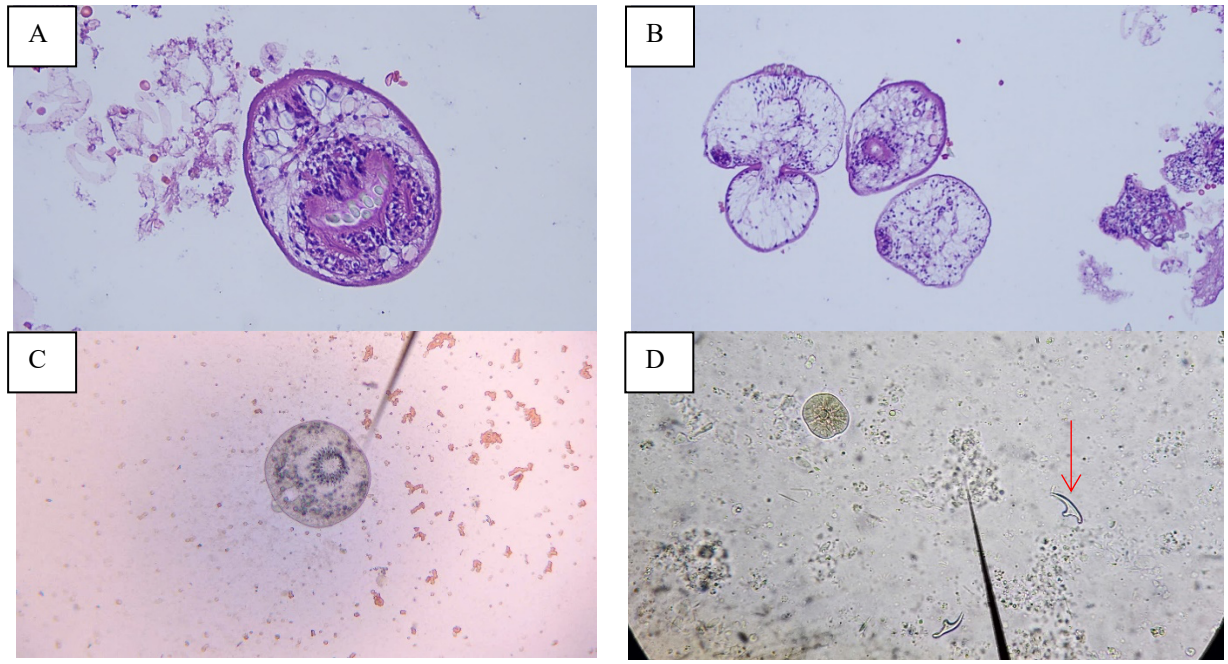

Fig. 2: Images of larval forms *Echinococcus* sp.: larval forms (A, B, C) and hooklets (D). All images are original and were captured by the authors during the histopathological examination of the patient's specimen

Because of cachexia and low PT (48%), the patient initially received outpatient supportive care and liver function optimization; PT remained 60%–62%. In June 2025, he was admitted to the Hematology Department for 3 wk, with PT around 63%–65%; a multidisciplinary team decided to proceed with left hepatectomy and complete excision of the cystic lesion.

The specimen revealed a ruptured hydatid cyst with purulent material, membranous fragments, and fibrotic liver parenchyma, consistent with abscess formation (Fig. 3). Postoperatively, the patient was stable, afebrile,

and pain-free; inflammatory markers normalized and discharge occurred after one week. Albendazole 400 mg twice daily was given for 28 d. At 3 months, no symptoms, complications, or recurrence were observed.

Fig. 3: Resected left hepatic lobe (Original)

Written informed consent was obtained from the patient for publication of this case report and accompanying images. All ethical issues were fully observed by the authors.

Discussion

Cystic echinococcosis (CE), commonly known as hydatid disease, is a neglected tropical zoonosis caused by the larval stage (metacestode) of the cestode *Echinococcus granulosus sensu lato* (1). The parasite's life cycle typically involves dogs as definitive hosts and ungulates like sheep as intermediate hosts, while humans act as accidental hosts through the ingestion of embryonated eggs via contaminated food, water, or direct contact with infected canines (1, 2). While CE is a significant health burden in pastoral regions of Central Asia and the Mediterranean, it remains exceptionally rare and under-reported in Southeast Asia and specifically Vietnam (7, 9).

In a non-endemic clinical setting such as Vietnam, the differential diagnosis for a suppurated hepatic cystic lesion is extensive and complex. The primary challenge lies in distinguishing complicated cystic echinococcosis (CE) from more common conditions, such as pyogenic liver abscesses, amoebic liver abscesses caused by *Entamoeba histolytica*, or infected biliary cystadenomas (2, 3, 4). Unlike pyogenic abscesses, which typically present with acute neutrophilia and a poorly defined periphery on imaging, our patient exhibited an atypical lymphocytosis and a well-demarcated thick-walled cyst. This distinction is critical, as misidentifying a parasitic cyst as a simple bacterial abscess can lead to inappropriate percutaneous drainage, which in the case of CE, carries a high risk of anaphylactic shock and peritoneal dissemination of larval forms (8).

Furthermore, clinicians must be wary of the limitations of serological tools. While ELISA for *E. granulosus* IgG is highly sensitive in WHO stage CE3a, cross-reactivity is a significant concern in tropical regions (8). In Vietnam, where other helminthic infections such as *Fasciola* spp., *Taenia solium*, and *Clonorchis sinensis* are endemic, a positive ELISA result alone may be misleading. Therefore, the definitive diagnosis cannot rely on serology in isolation; it necessitates a synergistic "triad" of epidemiological risk factors (e.g., dog exposure), pathognomonic radiological signs (such as the "water-lily" sign), and ultimately, direct parasitological confirmation of protoscolices or hooklets within the aspirated fluid (5, 6).

In this case, the identification of the laminated layer, germinal layer, and brood capsules containing protoscolices and hooklets provid-

ed definitive evidence of an active CE2–CE3 infection, distinguishing it from *Taenia solium* cysticercosis or simple serous cysts (5, 6).

A definitive diagnosis of CE in low-endemicity settings relies on a "triad" of epidemiological exposure, pathognomonic imaging, and parasitological confirmation (8).

Imaging: Ultrasound in our patient revealed a well-defined CE3a cyst in the left lobe characterized by a thick wall and the pathognomonic "water-lily sign" (detached floating membranes) (5). CT imaging further supported this with a low-attenuation cyst and an enhancing rim, indicative of inflammation (6). Serology: The diagnosis was bolstered by a positive ELISA IgG (OD 0.878; cut-off 0.350). While ELISA is highly sensitive for active stages (CE1–CE3), clinicians must be wary of false positives due to cross-reactivity with other endemic helminths like *Fasciola* (8). Immunological Paradox: A notable finding was the predominant lymphocytosis (60.6%) despite the presence of an abscess. Typically, bacterial suppuration triggers neutrophilia (3). However, in CE, the prolonged presence of parasitic antigens can induce a robust cell-mediated immune response, leading to chronic lymphocytosis or complex immunomodulatory pathways rather than a simple pyogenic reaction (1, 8).

The management of CE is stage-specific and influenced by cyst size, location, and complications (7). While the PAIR (Puncture, Aspiration, Injection, Re-aspiration) technique is an option for uncomplicated cysts (6), it was strictly avoided in this patient. The presence of suppuration occurring in 5%–40% of cases significantly increases the risk of biliary fistulas and life-threatening anaphylactic shock during needle maneuvers (3, 4).

In accordance with the 2025 WHO guidelines, radical surgery was the superior choice here (7). After correcting the patient's coagulation status, an anatomical left hepatectomy was performed. This radical approach ensures the total excision of the cyst and the surrounding fibrotic parenchyma, effectively neutralizing the risk of recurrence (7, 8). Following surgery, a 28-day course of Albendazole (400 mg twice daily) was administered to eradicate any remaining micro-residues. The absence of recurrence at the 3-month follow-up confirms the efficacy of this combined surgical-pharmacological approach.

Conclusion

This case highlights an unusual presentation of a superinfected left-lobe hepatic CE in a Vietnamese farmer. It underscores the necessity for clinicians in non-endemic regions to maintain a high index of suspicion for CE in patients with cystic liver lesions and a history of dog exposure. Strengthening local diagnostic capacity and adhering to radical surgical protocols for complicated cases are essential for preventing life-threatening outcomes.

Suppurated hepatic CE is a surgical emergency. This case emphasizes the importance of thorough epidemiological history and the need to strengthen diagnostic capacity for parasitic zoonoses in Vietnam to prevent the progression of asymptomatic cysts to life-threatening complications.

Conflict of interest

The authors declare that there is no conflict of interests.

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