

A Case Report of Lung Hydatid Disease Associated with Heart Disease from a Tertiary Care Centre of North India

Suruchi Shukla^{1*}, Senjuti Sengupta¹, Gopa Banerjee¹, Mohammad Zeeshan Hakim² and Sarvesh Singh²

¹Microbiology, King George's Medical University, India

²Cardio-thoracic vesicular surgery, King George's Medical University, India

*Corresponding Author: Suruchi Shukla, Microbiology, King George's Medical University, Lucknow, Uttar Pradesh, India.

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Abstract

This study presents the case of a 55-year-old woman from a rural village in Uttar Pradesh, North India, with a history of rheumatic heart disease. Over the past 3-4 years, she experienced nonspecific symptoms including intermittent fever, cough, chest pain, and shortness of breath, with reported exposure to pets and animals. Radiological assessments revealed a solitary hydatid cyst in the left lung, confirmed by microscopic examination of hydatid fluid and subsequent microbiological analysis detecting *Echinococcus* spp. The patient underwent surgical intervention alongside treatment with antiparasitic drugs for management.

Keywords: Tapeworm; Chest pain; Cestode; Hydatid fluid; *Echinococcus*

Introduction

Hydatid infection, caused by cestodes (tapeworms) belonging to the genus *Echinococcus*, poses a global health threat [1]. While carnivores serve as definitive hosts, humans function as accidental and intermediate hosts [1]. Various risk factors contribute to the prevalence of hydatid disease, including residency or travel to endemic areas, engagement in animal husbandry, access to contaminated water sources, ownership or proximity to dogs or sheep, as well as socioeconomic factors such as low education and income, age, and gender [2]. Transmission primarily occurs through the oro-fecal route or direct contact with infected animals [3]. Manifesting as a chronic condition, hydatid disease presents with a broad spectrum of symptoms and is often discovered incidentally [4].

Case Presentation

A 55-year-old female homemaker by profession from rural village of Pratapgarh district, Uttar Pradesh, North India; presented in December 2023 with complaints of on-off rise in temperature and use of over-the-counter and questionable medicines, cough, chest pain, shortness of breath since past 3-4 years in the Cardiovascular Thoracic Surgery (CVTS) outpatient department of King George's Medical University (KGMU). She is a known case of rheumatic mitral valve disease (stenosis with regurgitation), with secondary tricuspid regurgitation and atrial fibrillation. She presented with a history of dyspnoea on exertion with palpitations, along with anorexia, weight loss and malaise. She is a non-smoker, non-tobacco chewer, non-diabetic and non-hypertensive. She is illiterate with exposure to animals like dogs and buffalo.

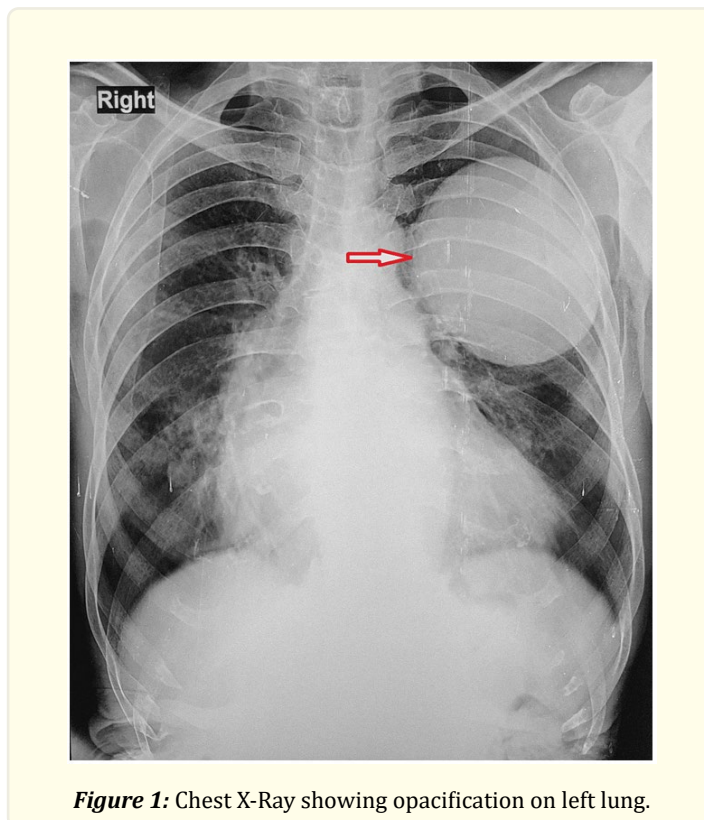
Clinical Investigations

On examination, patient was afebrile, with normal vitals and had no cyanosis, clubbing or lymphadenopathy. Chest examination revealed reduced air entry in the left upper portion posteriorly, with a mid-diastolic murmur on the cardiac apex. There was no significant per abdominal and central nervous system examination. The haemoglobin concentration was 8.9g/dl, white cell count was

16,600 cells/mm³, and platelet count was 1.10 lakhs, urea 47.8mg/dl, creatinine 1.56mg/dl, prothrombin time 23.6 and INR 1.82.

Radiological findings

On chest X ray a homogenous opacity occupying left hemithorax (figure1) with midline shift of the mediastinum was present. HRCT thorax showed a large well-defined oval homogeneously enhanced hypodense lesion of fluid density and peripheral enhancing walls and eccentric thickening in apico-posterior segment of left upper lobe of lung along D4-D5 vertebra (~8.2x9.8x9cm) suggestive of hydatid cyst.



Laboratory findings

The hydatid fluid was aspirated and sent for staining and microscopy to microbiology laboratory. Wet mount and Giemsa staining of the fluid was conducted. Wet mount and Giemsa staining of the fluid was seen under 400X and 1000X magnification. On microscopy, multiple hooklets and multiple scolices within the capsule were seen on wet mount and Giemsa staining respectively which was confirmed to be the Echinococcal spp infection. (Figure 2 and 3)The Anti-IgG antibodies for Echinococcus manufactured by NovaTeclmmunodiagnostica GmbHwith expiry date: 31-05-2024, batch no: ECHG0130 and lot no: ECHG-086 detected positive in high titres (13.63 U/ml; ref interval <8U/ml) which supported the diagnosis.

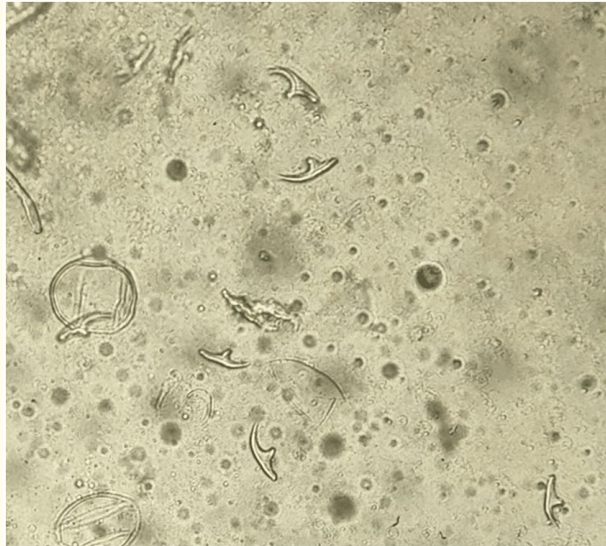


Figure 2: Microscopic examination of Hydatid fluid aspirated from Lung: Hooklets of Echinococcus spp on wet mount.

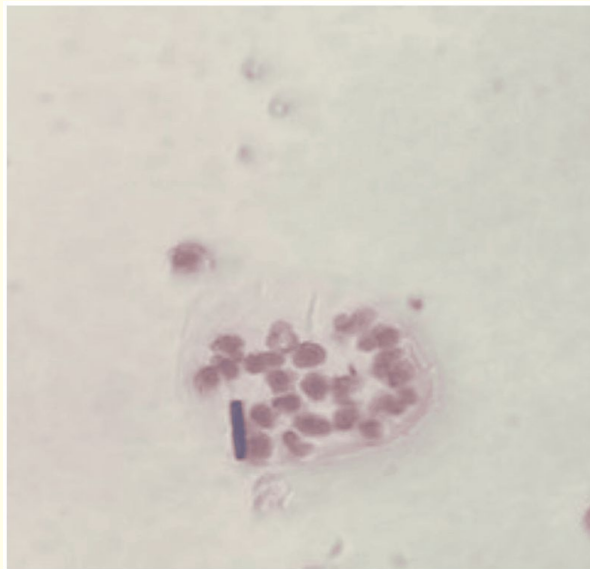


Figure 3: Microscopic examination of Hydatid fluid aspirated from Lung: Multiple scolices within the capsule on Giemsa stained smear.

Management

Patient was started on antiparasitic drug i.e. tablet Albendazole 400mg twice daily. She underwent surgical excision of the hydatid cyst through left thoracotomy and mitral stenosis was then addressed in the same sitting by performing mitral valve replacement. The patient did well post-operatively, without complications and was discharged on post-operative day 10.

Discussion

Hydatid disease is common but neglected zoonotic infection worldwide. Cases of hydatid cystic echinococcosis (*Echinococcus granulosus*) are globally distributed whereas alveolar echinococcosis due to *Echinococcus multilocularis* are present in northern hemisphere countries such as Russia, China, America and Europe [5].

The prevalence of human Hydatid disease in endemic regions may be high as 5-10% especially in slaughtered animals [6]. India is endemic region for hydatid diseases with incidence around 1 to 200 /100000 population but since the diseases is unsuspected and underdiagnosed, exact numbers cannot be reported. Andhra Pradesh, Tamil Nadu and Rajasthan are Indian region where echinococcosis cases are more prevalent [7].

As per the literature, the Liver is the most common site for the localization of hydatid cyst followed by the lungs, muscles, spleen brain and bone. According to previous studies by Arinc et al., lung cysts are usually single and unilateral involving right lung more than left. Bagheri and Baruah et al reviewed the past papers and concluded that the right lung and preferably lower posterior lobe (60%) is most commonly affected; however, our patient had left apical unilocular lung cyst closely associated with underlying rheumatic heart disease [8]. Generally various preventive measures are adopted as public health measures for stopping the spread of echinococcus disease such as vaccination of livestock animals like sheep and lambs, deworming of dogs and culling of older sheep.

Conclusions

Hydatid disease, a rare zoonosis prevalent in rural areas across various regions, demands a tailored approach combining surgical and medical interventions. The complexity of treatment hinges upon factors such as the number, size, and location of cysts, warranting a multidisciplinary strategy for optimal management. Comparative studies indicate that employing the PAIR (puncture, aspiration, injection of scolicalidal agents, and re-aspiration) technique alongside albendazole or mebendazole yields superior clinical and parasitological outcomes while minimizing both major and minor morbidity rates, mortality, and disease recurrence. Additionally, this approach is associated with shorter hospital stays, underscoring its potential to enhance patient care and streamline healthcare delivery.

Implementing these advanced therapeutic modalities holds promise for bolstering hydatid control initiatives, potentially accelerating the timeline for achieving effective disease prevention. With the integration of these innovative measures, the timeframe for curtailing disease transmission could be significantly reduced, possibly achieving notable progress within 5 to 10 years.

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