

## Pulmonary Hydatid Cyst Presenting As Massive Unilateral Pleural Effusion

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### Abstract

Malignancy, parapneumonic effusion, and tuberculosis are all common causes of massive pleural effusion but massive pleural effusion due to parasitic infections is rare. Even in endemic areas Pulmonary parenchymal hydatid cysts are uncommon entities and Extra-parenchymal hydatid cysts ex. intra-pleural are even rarer. We report a case of a 75-year-old male who developed massive unilateral pleural effusion following rupture of intra-pleural hydatid cyst. The aim of this case report is to draw attention of this uncommon cause of pleural effusion and assess the complications and treatment options.

**Keywords:** Hydatid cyst, intra-pleural, pleural effusion

### Introduction

Malignancy is the most common cause of massive pleural effusion, accounting for 11.2% of all the pleural effusions. [1] Its etiology and frequency have remained largely undetermined and therefore not known. Hydatid cyst mimicking as massive effusion is extremely rare. Here, we report a rare case of pulmonary hydatid cyst manifested as massive pleural effusion.

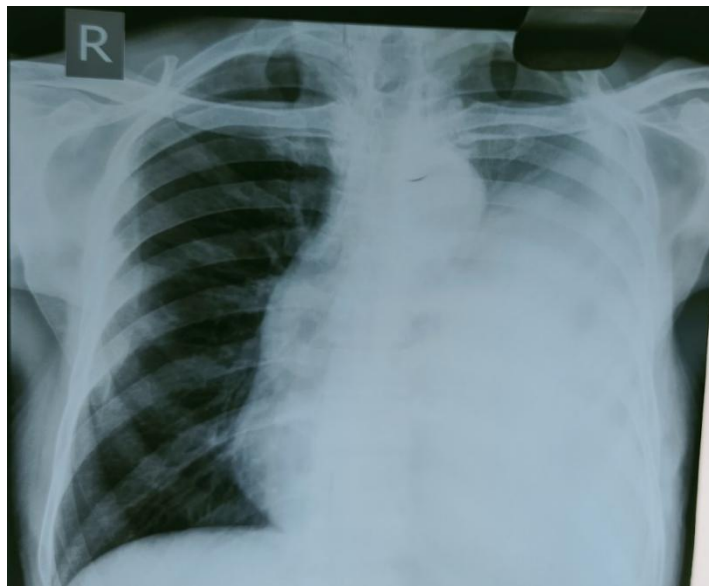
Hydatid disease is a zoonotic disease most commonly caused by larval stages of *Echinococcus granulosus*. Humans act as an accidental intermediate host. Infection is acquired by ingesting food or soil contaminated with eggs shed by the definitive host, canines. In primary Echinococcosis, Larval cysts can develop in almost every organ. This disease is present all over the world and is endemic in parts of Turkey, South America, Russia, Australia, Tunisia and Mediterranean countries.[2] It is also common in Indian subcontinent. It mainly affects liver (60%) and lungs(30%) the pleura or chest wall can be involved

in 0.9-7.4% of patients with hydatid disease[3,4]. It also involves other organs like heart, kidney, bone and brain. Pulmonary hydatid cysts are normally asymptomatic until they rupture and cause productive sputum, hemoptysis, and fever or they may present as pleural effusion. The treatment of choice for hydatid cysts of the lung are Surgery or percutaneous aspiration.[5,6]

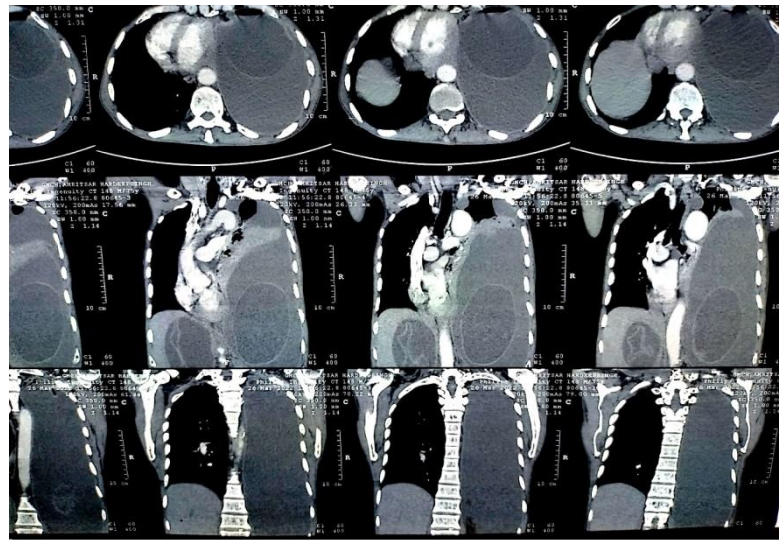
### Case Report :

A 75 year old male non-smoker non-alcoholic farmer by occupation developed left sided chest pain and heaviness from last 3 months and low grade fever for last 2 months. There was also history of dry cough since 3.5 months. There was no history of shortness of breath. There is no previous history of tuberculosis, and patient was non diabetic, non-hypertensive. General physical examination was within normal limits. Respiratory system examination revealed diminished movement of left side of chest with shifting of trachea and heart to right side but there was no swelling and tenderness. On percussion

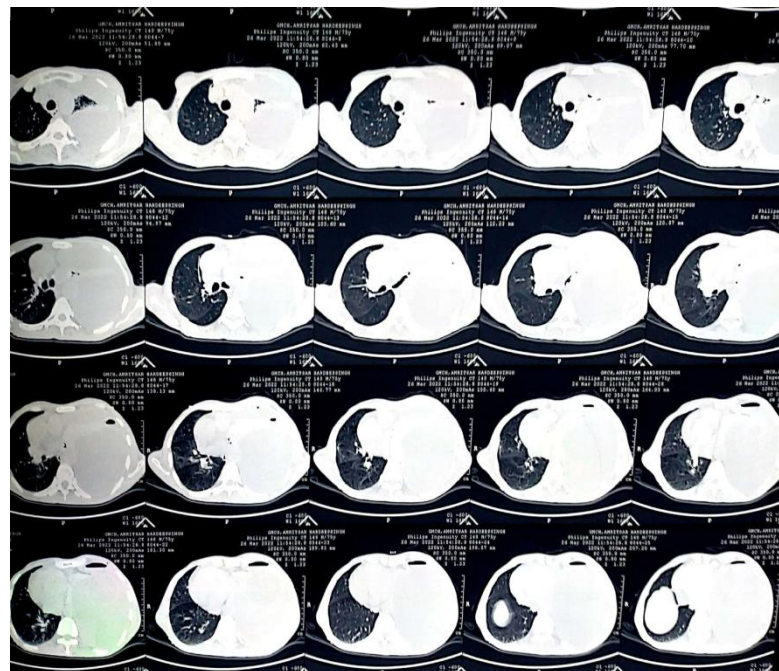
there was dull note over left hemithorax. On auscultation there were absent breath sounds and diminished vocal resonance. All lab investigations i.e. CBC including haemoglobin, LFT, RFT, serum electrolytes were within normal limits. Viral markers were negative for the patient. Sputum for AFB, G/S - C/S, fungus were negative. Sputum for CBNAAT was negative. Chest X-ray revealed complete homogenous opacity involving left side of chest (Fig. 1). Ultrasound chest of patient revealed pleural effusion left side with hydatid cyst. CECT chest showed large well defined thick walled, round to oval, peripherally enhancing cystic lesion of size 14.6x9.5x9.7 cm with CT attenuation in left lung parenchyma. The lesion is showing hyperdense enhancing serpentine floating membranes in it suggestive of ruptured membranes but no calcification was seen along the walls of cyst. The lesion caused mediastinal shift towards right. Liver showed well defined round to oval lesion measuring 10x8.5 cm in size in segments 5, 6ab, 8 of right lobe of liver. These lesions were showing hyperdense enhancing serpentine floating membranes in it suggestive of ruptured membranes-features suggestive of hydatid cyst with rupture of membranes and moderate to massive pleural effusion (Fig. 2&3). Echinococcus detection for scolices in hydatid cyst fluid was negative. The patient was then started on tab albendazole 400mg b.d, tab praziquantel 600mg once weekly and tab amoxclav 625mg b.d.



**FIG. 1 CHEST X-RAY SHOWS LEFT SIDED MASSIVE PLEURAL EFFUSION**



**FIG. 2. CECT CHEST SHOWS THICK WALLED, ROUND TO OVAL, PERIPHERALLY ENHANCING CYSTIC LESION IN LEFT LUNG PARENCHYMA AND WELL DEFINED ROUND TO OVAL CYSTIC LESION IN LIVER WITH HYPERDENSE ENHANCING SERPENTINE FLOATING MEMBRANES SUGGESTIVE OF RUPTURE MEMBRANES.**



**FIG. 4. CECT CHEST SHOWS MODERATE TO MASSIVE AMOUNT OF FREE FLUID IN LEFT PLEURAL CAVITY WITH UNDERLYING COLLAPSE/CONSOLIDATION**

**Discussion:**

Pleural effusions are a common medical problem with over 50 known causes, including intra pleural illness or underlying lung diseases, systemic conditions, organ dysfunction and drugs. Clinical manifestations vary widely depending on the parasitic load, status and location of the cyst. The presenting symptoms are cough, followed by chest pain of varying severity. Ruptured cyst may present with productive cough, fever, repetitive haemoptysis, pleural effusion or anaphylactic shock.[7] Effusions are said to be massive if it involves the entire hemithorax or at least two-thirds of pleural space. Massive pleural fluid collection can be caused by a wide range of clinical conditions that can be classified as malignant and nonmalignant [8] but pleural effusion due to parasitic infection is infrequent. Hydatid disease in humans occurs by infection with the larval stage of the tapeworm *Echinococcus granulosus* (the dog tapeworm) or *Echinococcus multilocularis* (the fox tapeworm). Humans acquire the infection by ingesting the eggs due to poor hygiene practices or contaminated food and water [9]. It mainly affects liver (60%) and lungs (30%) the two organs can be affected simultaneously in about 5-13% of cases[10], the pleura (most commonly pleural space) or chest wall can be involved in 0.9-7.4% of patients with hydatid disease[3,4]. However, any organ can be involved[3]. 50% of the pulmonary cysts are localized in the right lung, 40% in the left lung, and 10% bilaterally. Most pulmonary cysts are located in the lower lobes (posterior > anterior). This disease is present all over the world and is endemic in parts of Turkey, South America, Russia, Australia, Tunisia and Mediterranean countries.[2] It is also common in Indian subcontinent.[11] Patients with pulmonary hydatid cysts are normally asymptomatic until they rupture. Cyst rupture may occur spontaneously or as a result of trauma and once cyst ruptures it may cause productive sputum, hemoptysis, chest pain, anaphylaxis, fever or expectoration of the cyst material (if gets ruptured into bronchus) or may present as pleural effusion, empyema and pneumothorax. (if rupture of cyst occurs in pleural cavity). Rupture may occur into the pericardium or mediastinum, lung and bronchial tree, pleural cavity, or peritoneal cavity. [12] The index patient presented with cough, fever and chest pain due to pleural

effusion. Super-infection of the cysts can also happen (most commonly by *Haemophilus influenzae*). [13] Diagnosis is based mainly on the imaging procedures which is supported by appropriate serology and in some cases even histopathology. CT is probably the best technique to evaluate the nature and location of the cyst, determining their relation with adjacent organs and thus evaluate the cyst preoperatively, and also to detect additional cysts, which are not seen on chest X-ray. Cyst density may help in differentiating parasitic from nonparasitic cysts. [14] Hydatid cysts of the lungs can be classified as simple cysts, complicated cysts, and ruptured cysts (including cysto-bronchial communication) on the basis of density and clinical symptoms. On CT, Inverse crescent sign and signet ring sign are most common findings of pulmonary hydatid cysts while ruptured or complicated hydatid cyst presents as detached or collapsed endocyst membrane, collapsed daughter cyst membranes, and intact daughter cysts on CT. [15] Hydatid cysts of the liver commonly undergo calcification, but calcification is rare in pulmonary or mediastinal hydatid cysts. Magnetic resonance imaging is likely superior than CT scanning in the evaluation of postsurgical residual lesions and recurrences. [16],[17] Hydatid disease should be considered in the differential diagnosis of eosinophilic pleural effusions in endemic areas because pleural studies have revealed eosinophilic predominance in case of hydatid pleural effusion.

Surgical resection is the treatment of choice in any ruptured or large pulmonary hydatid cyst i.e complete excision of cysts with maximum preservation of lung parenchyma. Although the percutaneous aspiration, injection of cysticidal agent, and Re-aspiration using radiographic guidance (PAIR) method are commonly used in treatment of hydatid liver disease but WHO currently recommends that PAIR should not be used as treatment in case of pulmonary cysts [18]. Percutaneous aspiration in a suspected case of hydatid cyst is generally not recommended because of the risk of an allergic reaction including systemic anaphylaxis, and also because of the chances of the spread of the disease due to spillage of the cyst's contents. However, Karawi et al. postulated that an anaphylactic reaction occurs only if there is a direct contact between the fluid from the ruptured cyst and the circulation or if the patient is allergic to hydatid fluid.[19] From 4 days before to at least 1

month after surgery, albendazole (10–15 mg/kg/day) should be administered in two divided doses. Antihelminthic therapy before surgery has demonstrated to reduce the risk of recurrence by 3.5 times [20].

Patients in the high risk group, such as those with ruptured cysts, should receive additional medical therapy with albendazole.[21] The role of antihelminthics is not clearly established, although there is evidence that they are capable of sterilizing cysts and curing some of them, though they are not always effective. But when a cyst ruptures, the antihelminthic albendazole must always be used in conjunction with surgical treatment.

Depending on the location of the cyst in the thorax, many approaches for mediastinal hydatidosis are recognised including right and left thoracotomy, sternotomy. Postero-lateral approach is most commonly used. One-stage surgery is superior to classic two-stage approach as it decreases the morbidity, hospital stay and costs. [22] Cyst management can either be radical such as segmentectomy, lobectomy, and pneumonectomy or a more conservative approach such a cystectomy and intact cyst enucleation or removal after needle aspiration. Although radical removal of the germinative membrane and pericyst by the appropriate thoracic incision is the gold standard, but in most cases simple cystectomy serves with equivalent results.

### Conclusion:

Pulmonary echinococcosis can rarely present as massive pleural effusion especially in endemic areas and thus this diagnosis should be kept on differential diagnosis in endemic areas. The use of CECT chest acts as an additional diagnostic tool to pinpoint the underlying cause of pleural effusion.

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