

## Acute empyema due to intrapleural rupture as the presenting manifestation of amoebic liver abscess: A case report

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### Abstract

Amoebiasis is a widespread parasitic infection caused by *Entamoeba histolytica*, commonly observed in developing world. Even though intestinal amoebiasis is the commonest clinical manifestation, it is well known to affect multiple extraintestinal organs; of which liver abscess is the commonest complication. Pleuropulmonary involvement, seen as the second most common extraintestinal disease, may occur through to various mechanisms, though frequently encountered in association with liver abscesses. Amoebic liver abscesses (ALA) can rupture in to adjacent structures resulting in potentially life-threatening complications.

The author reports a case of amoebic liver abscess rupturing into pleural cavity producing acute empyema as the presenting complain.

### Keywords

Amoebiasis; liver abscess; ruptured liver abscess; pleuropulmonary amoebiasis.

### Abbreviations

ALA: Amoebic liver abscess.

### Introduction

Amoebiasis is a parasitic infection caused by intestinal protozoan *Entamoeba histolytica* [1]. It continues to pose a serious public health concern, especially in developing countries where there is inadequate hygiene and limited access to sanitation [2]. It is estimated that around 40 million people are infected globally, resulting in 40,000 to 100,000 deaths annually [1].

Transmission of amoebiasis occurs through feco-oral route usually due to ingestion of contaminated water or food which contains cyst form; though possible transmission due to male homosexual activities is

also recognized [3]. Trophozoite form, released at small intestine following excystation migrates to colon, where it adheres and lyses the epithelium producing characteristic flask-shaped ulcer [1,4]. However, majority of infections are asymptomatic. Amoebic colitis is the most frequent clinical presentation, which can have a wide spectrum of manifestations ranging from mild watery diarrhea to fulminant infection resulting in bowel necrosis, perforation or toxic megacolon [2].

Along with mucosal invasion, amoeba gain access to portal vein and potential for dissemination to extraintestinal sites such as liver, lung or brain [1,4]. Formation of liver abscesses is the most common extraintestinal manifestation occurring in less than 1% of cases [1]. ALA can rarely rupture into pleural, peritoneal or pericardial cavity resulting in devastating outcome [1,2,4].

The author reports a rare case of intrapleural rupture of an amoebic liver abscess causing empyema in a middle aged male.

## Case Presentation

A 51-year-old Sri Lankan male presented with acute onset right sided pleuritic type chest pain associated with right shoulder tip pain for one day. This was associated with dyspnoea, which was gradually progressive causing shortness of breath even at rest. However, he denied significant history of fever, cough, sputum production or hemoptysis. Moreover, there was no abdominal pain, recent alteration of bowel habits, or constitutional symptoms like loss of appetite or loss of weight. Past medical history was unremarkable. He was a farmer by profession and consumed alcohol regularly in the form of locally produced toddy.

Physical examination noted averagely built male without lymphadenopathy or clubbing. Examination of respiratory system revealed reduced movements, absent breath sound and stony dullness in right lower chest. He was dyspnoic having respiratory rate of 22 cycles per minute, but capillary oxygen saturation was maintained at 98% with room air. An enlarged tender liver was noted during the abdominal palpation. Rest of the examination including hemodynamic parameters was within normal limits.

Initial investigations noted white cell count of  $11400/\text{mm}^3$ , which raised up to  $25600/\text{mm}^3$  on day 03, hemoglobin 10.7 g/dl, platelet count  $398 \times 10^3/\text{mm}^3$ , C-reactive protein 520 mg/l (0-10 mg/l), sedimentation rate 70 mm/hour, Aspartate aminotransferase 29 U/l (5-40), Alanine aminotransferase 33 U/l (5-40), Alkaline phosphatase 55 U/L (35-135), total bilirubin  $9.7 \mu\text{mol/L}$  (3-18  $\mu\text{mol/L}$ ). Immediate chest radiograph demonstrated right sided moderate pleural effusion without other significant abnormality (figure 01). Ultrasound guided pleural aspiration was performed, which yielded 70 ml of blood stained pus. Further evaluation of pleural aspiration was negative for acid fast bacilli, Xpert MTB/RIF®, gram stain, bacterial culture and amoeba parasites. Ultrasound examination of the abdomen found a liver abscess situated at segment VIII of right lobe, which was continuing to the pleural effusion through the diaphragm. Contrast enhanced computerized tomography further visualized a single liver abscess of  $3.8 \times 5.4 \times 6.3 \text{ cm}$  in size, ruptured in to right pleural space with resulting large pleural collection (figure 02). Ultrasound image guided aspiration of the liver abscess was undertaken, but only 50 ml of thick pus with characteristic “anchovy sauce” appearance drained. Bacterial culture, gram staining, acid fast staining or Xpert MTB/

RIF® of liver aspirate failed to gain any positive results. However, examination under direct microscopy revealed amoebic trophozoites confirming the diagnosis of ALA.

Intravenous metronidazole and ceftriaxone were commenced immediately for the management. Large bore intercostal tube was inserted aiming to drain pleural effusion; however it drained minimally due to loculated nature of the collection. The patient refused further invasive interventions for drainage of pleural effusion, since he was clinically improving with medical management. Similarly, further attempt on aspiration of liver abscess was not made due to success of medical treatment. ALA and empyema completely resolved with 6 weeks treatment of oral metronidazole.

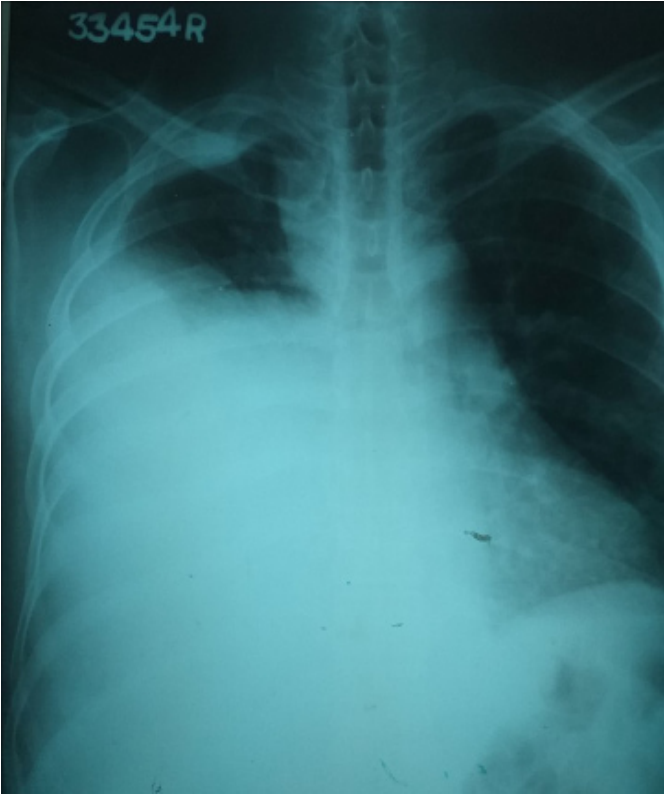


Figure 1: Chest X-ray image showing right sided pleural effusion.

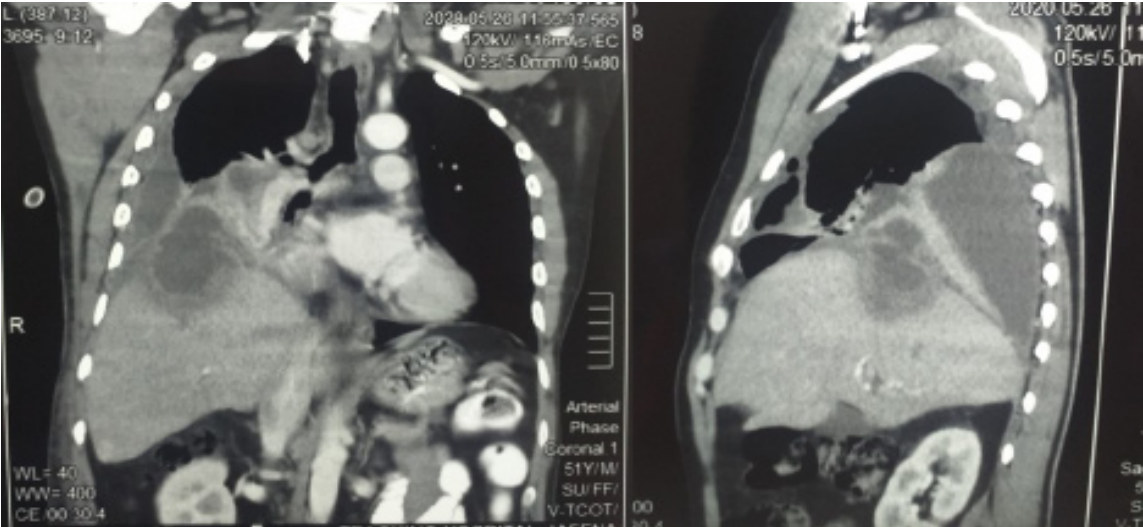


Figure 2: Computerized tomographic images showing ALA rupturing into thoracic cavity through diaphragm.

## Discussion

Amoebiasis is a worldwide public health hazard; though people in developing countries are at highest risk due to poor socioeconomic condition and inadequate sanitation [4]. Sri Lanka being a developing tropical country has suffered from amoebiasis for decades since its first recognition in 1962. Though, overall incidence of amoebiasis and ALA have declined in other parts of the island, it remains a common health issue in northern province, where it is recognized as a frequent cause for emergency department visits [5].

Even though our patient was more than 50 years of age, amoebic liver abscesses are encountered predominantly among people of 20 to 40 years [2]. Although distribution of intestinal infection is similar between males and females, liver abscesses are reported 10 times higher among males [1]. Exact reason for this gender related disparity remains obscure. Proposed mechanisms include alcohol related liver damage in males, and protective effect of relative iron deficiency anemia or hormonal influence in reproductive age females [1]. Additionally, strain virulence, host's genetic susceptibility, immune status and environmental factors have been recognized as predictors of invasive disease [4].

Majority of ALA present with fever and right hypochondrial pain, typically without a history of intestinal disease [2]. However, our case had a subtle background without fever or abdominal pain; instead presented with sudden onset pleuritic chest pain due to acute intrapleural rupture. Therefore, this emphasizes the need for suspicion of liver pathologies while evaluating pleural effusions.

Rupture of ALA into pleural, pericardial or peritoneal spaces is a recognized complication. It is reported that rupture into pleuropulmonary system occurs in up to 40% with ALA, while peritoneal rupture seen in 7% of cases [1]. Lungs are the second most common extraintestinal organ affected [4]. Pleuropulmonary complications occur almost exclusively in individuals with a liver abscess [6], though cases of the primary form of pulmonary amoebiasis caused by amoebae reaching the respiratory tract by direct embolism from the intestinal tract have been reported rarely [7]. Thoracic amoebiasis may be due to contiguous spread through the diaphragm, transdiaphragmatic lymphatic extension, or embolic spread through the circulation [7]. Additionally, ALA can induce inflammatory reaction in adjacent structures leading to reactive pleural effusion, basal pneumonitis and pericardial effusion [8].

Ultrasound examination is considered as the initial imaging methodology for diagnosis of ALA since its high degree of sensitivity [1]. Number of diagnostic modalities are available to assist with microbiological diagnosis, including microscopy, antigen detection, molecular tests, and serology. However, since most cases of ALA occur without concurrent intestinal infection, stool studies have lower sensitivity for diagnosis of ALA [2]. Pleural aspiration can be done to demonstrate parasite in the case of empyema, but reported only in less than 10% of cases reported by Ibarra-Perez et al. [8]. Main differential diagnosis includes pyogenic abscesses, malignancies and hydatid cysts [1]. However, pyogenic abscesses tend to be multiple, occurring in older individuals with underlying hepatobiliary comorbidities, having no sex predilection and generally associate with positive blood or aspirate bacterial cultures compared to ALA [1].

Specific treatment includes amoebicidal agents such as metronidazole or tinidazole coupled with luminal agents to clear intestinal parasites [4]. Percutaneous aspiration of ALA is known to enhance clinical recovery, accelerate resolution and prevent complications. The procedure is considered in the presence of persistent clinical symptoms, large liver abscesses of the right lobe in imminence of rupture, abscesses of the left lobe, pregnant patients with amoebic lesion for whom metronidazole is contraindicated, pleuropulmonary complications or lack of clinical improvement [9]. Though our patient had a complicated liver abscess, further attempts on drainage was not required due to success of medical management.

## Conclusion

Amoebiasis is a common parasitic infection which can induce multiple complications. ALA is the commonest extraintestinal disease, which can be life-threatening especially when ruptured in to adjacent structures. Such ruptures can be the initial manifestation of ALA without having prior symptoms. Therefore, clinicians should suspect complicated ALA while evaluating pleural effusions, especially in tropical background.

## Author's contribution

AB (MBBS, MD, MRCP) is an acting consultant respiratory physician and involved in active management of the patient and drafting the manuscript.

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