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## International Journal of Surgery Case Reports

Scopus coverage years: from 2010 to Present

Publisher: Elsevier

ISSN: 2210-2612

Subject area: Medicine: Surgery

Source type: Journal

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0.9



SJR 2021

0.198



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<b>COUNTRY</b> Netherlands 	<b>SUBJECT AREA AND CATEGORY</b> Medicine Surgery	<b>PUBLISHER</b> Elsevier BV
<b>H-INDEX</b> <b>19</b>	<b>PUBLICATION TYPE</b> Journals	<b>ISSN</b> 22102612
<b>COVERAGE</b> 2010-2020	Support - Scopus journal	





ISSN 2210-2612

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## Case report

## Secondary pleuropulmonary amoebiasis due to liver abscess rupture: A complication case report in low resource setting

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## ARTICLE INFO

## Keywords:

Amoebiasis  
Amoebic liver abscess  
Empyema  
Percutaneous aspiration drainage

## ABSTRACT

**Background:** Pleuropulmonary amoebiasis caused by complications of amoebic liver abscess (ALA) is rare.

**Case presentation:** A 23 years old male, presented with shortness of breath, cough with yellowish phlegm, right chest pain, fever, bulging stomach, yellow eyes, and swelling of both legs. Abdominal ultrasound and CT scan thorax and abdomen revealed right fluidopneumothorax and liver abscess. Serological testing leads to *Entamoeba histolytica* infection, which was treated with metronidazole but no significant improvement on empyema and abscess liver size. Surgery was performed after percutaneous aspiration drainage failed to evacuate the abscess. HE and PAS staining from surgical tissue showed *Entamoeba histolytica* infection.

**Discussion:** Serological testing and radiological examination will be more useful in the early detection of cases of *Entamoeba histolytica* infection. Surgery may be considered when purulent drainage does not show improvement in the patient's condition.

**Conclusion:** ALA complication that causes pulmonary empyema can be surgically treated if the pus cannot be drained.

## 1. Introduction

Amoebiasis is an infection caused by the parasite *Entamoeba histolytica* with or without clinical manifestations [1,2]. Currently, it is estimated that 40–50 million people suffer from amoebiasis in developing countries and about 40,000 people died from amoebiasis [3]. The incidence of amoebiasis in Indonesia is quite high between 10 and 18%, with a Crude Fatality Rate (CFR) ranging from 1.9%–9.1%. *Entamoeba histolytica* can invade the intestinal mucosa and spread to other organs, especially the liver [1,4,5]. The incidence of amoebic liver abscess (ALA) varies between 3 and 9% of all amoebiasis cases [1,2,6].

Ruptured ALA can result in pleural infection [6], in which pleuropulmonary complications are estimated to occur in 7–20% of patients with ALA and can cause empyema that affects the lung parenchyma and triggers bacterial pneumonia [4,7]. Meanwhile, amoebiasis causing pulmonary empyema is reported as much as 1–2% [3]. Based on the description above, we are interested in reporting a case report of pleuropulmonary amoebiasis due to liver abscess based on the Surgical Case Report (SCARE) 2020 guideline [8].

## 2. Case presentation

A 23-years old Madurese male presented with a chief complaint of shortness of breath for 2 weeks, worsened 4 days before admission. The patient also complained of cough with yellowish phlegm and right chest pain, fever, bulging stomach, yellow eyes, and swelling of both legs. The patient had a bad habit of consuming water without cooking it first. The patient underwent treatment for 4 days which resulted in chest tube insertion in the right hemithorax and was given anti-tuberculosis drug first category plus empirical antibiotics but no improvement.

On physical examination, we found tachycardia, with Wong-Baker pain scale 3, anemic conjunctiva, sclera jaundice, dyspnea, and trachea being deviated to the left. Right hemithorax was diminished, a chest tube between 5th ribs in the right anterior axillary line of the right hemithorax, decreased palpation fremitus, dim percussion, and decreased vesicular breath sounds in the right hemithorax. The abdomen was distended, dim percussion in the right hypochondrial region, positive shifting dullness, tenderness in all quadrants, palpable liver enlarged 3 cm below the arch of the ribs, the flat surface is not humped. Pitting edema in both lower limbs. Laboratory results showed a

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<https://doi.org/10.1016/j.ijscr.2021.106231>

Received 20 June 2021; Received in revised form 18 July 2021; Accepted 20 July 2021

Available online 21 July 2021

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total leukocyte count of 12,190 cells/mm<sup>3</sup>, neutrophils of 88.4%, serum aspartate aminotransferase (AST) of 221 U/L, and serum alanine aminotransferase (ALT) of 54 U/L. A rapid molecular test of sputum and empyema was *Mycobacterium tuberculosis* not detected. We also checked anti amoeba serology test (ELISA) with a result of 37.8NTU (positive cut off >11NTU).

Chest X-ray showed right fluidopneumothorax and chest tube attached with the distal tip at the level of 4th thoracic vertebrae thoracic 4th and trachea deviated to the left. Abdominal ultrasound showed heterochronic lesions with partially defined borders and irregular edges in the right lobe of the liver which on CDUS examination showed minimal perihilar vascularization suggestive liver abscess. CT scan thorax and abdomen with contrast showed loculated right fluidopneumothorax with thickening parietal and visceral pleura and hepatomegaly accompanied by abscesses with gas-forming in segments VII and VIII of the right lobe of the liver which penetrated the subcapsular liver of the posterior VII-VIII segments with air density represent ruptured liver abscess (Fig. 1).

Reddish-brown pleural fluid was collected from the thorax drain. No protozoa were found from direct smear examination of pleural fluid. From the aerobic culture of pleural fluid, we found *Mycrococcus lylae*. The patient was treated with double antibiotics according to the result of pleural fluid culture and anti amoeba serology test, meropenem 1 g/8 h, and metronidazole 750 mg/8 h intravenous. The patient's condition was improved after 2 weeks of receiving antibiotics but chest X-ray and abdominal ultrasound evaluation showed no significant improvement of right lung and abscess liver size. We had already performed percutaneous aspiration drainage guiding ultrasound for the abscess but failed, so the patient underwent surgery.

The patient underwent surgical decortication and repair of hepatopleural fistula by thoracic and cardiovascular surgery and drainage of liver abscess by digestive surgery. On exploration, the right subdiaphragmatic cavity was found in segments VII and VIII of the liver, a thickened and torn diaphragm attached to the liver wall, and condensed pus. Adhesiolysis, diaphragm repair, and intra-cavity and thoracic drainage (Fig. 2). Microbiological examination of abscess did not show bacteria or fungi growth and histopathological examination showed extensive necrotic tissue with suppurative chronic inflammation. Hematoxylin-eosin (HE) and Periodic Acid Schiff (PAS) staining for this preparation showed *Entamoeba histolytica* in both abscesses obtained from the thorax cavity and liver (Fig. 3).

Post-surgery vital signs were stable, SpO<sub>2</sub> was 97%, chest X-ray showed controlled right fluidopneumothorax and abdominal ultrasound results showed Hypochoic lesion without internal moving echo accompanied by peripheral calcification in segment VII, size ±8.1 × 6.4 cm impressive healing process abscess (smaller size than before). The patient was given metronidazole 750 mg/8 h and albumin extract, the patient experienced clinical improvement.



Fig. 2. Adhesiolysis procedure in which the right subdiaphragmatic cavity and condensed pus were found.

### 3. Discussion

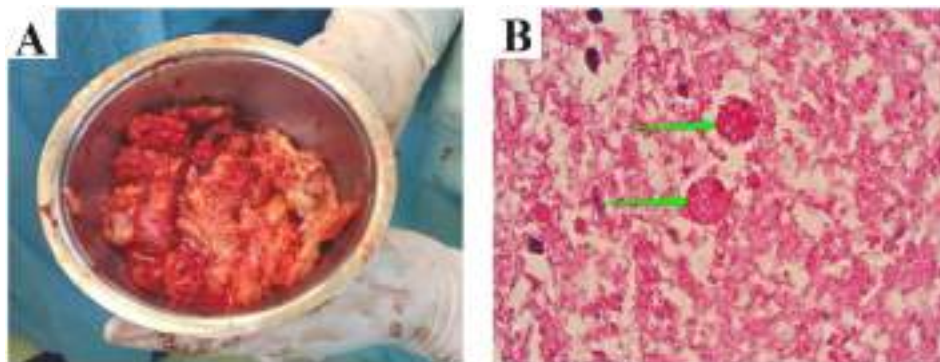
Liver abscess is the most common extraintestinal complication encountered due to amoebic invasion of the portal vein [1,6,9]. Abscesses are generally homogeneous, containing thick exudate, varying in color from creamy white to reddish brown (anchovies like) caused by digestion of liver tissue. This pus is almost always sterile except when secondary infection occurs due to pyogenic abscesses. Amoeba can be found at the edge of the lesion by microscopic examination but is rarely detected in the pus or in the abscess cavity itself [10,11]. The most important complication is abscess rupture into the peritoneal cavity, pleural cavity, or pericardial cavity depending on the location of the abscess in the liver. As much as 7–20% of ALA will rupture into the pleural cavity and cause empyema [4,7].

During hospitalization, the patient received intravenous metronidazole therapy at a dose of 750 mg/8 h. Most patients with metronidazole show response to treatment (decreased fever and abdominal pain) within 72–96 h [12,13]. Percutaneous needle aspiration is performed in cases of ALA with persistent clinical complaints, large right lobe liver abscess at risk of rupture, left lobe liver abscess, patients who are pregnant, amoebiasis with pleuropulmonary complications, and no clinical progress after administration of medical therapy [14,15]. But, in this case, percutaneous aspiration was failed because the pus was solidified so the patient underwent surgery. Surgical intervention is only performed in patients with multiple abscesses, percutaneous aspiration cannot be done, abscess size is large (> 5 cm), and with complications [1,14].

The high mortality of amoebiasis is caused by socioeconomic factors,



Fig. 1. A. Chest X-ray showed right fluidopneumothorax with chest tube insertion; B. CT scan showed right fluidopneumothorax.



**Fig. 3.** A. Post-surgery tissue draining pus in the pleural cavity and liver abscess; C. *Entamoeba histolytica* (shown arrows) from HE and PAS staining of the evacuated abscess.

age, malnutrition, late diagnosis, and inadequate treatment [16]. The prognosis of patients with ALA can be easily identified through clinical evaluation, biochemical, and ultrasonographic criteria. Bilirubin levels >3.5 mg/dL, encephalopathy, abscess cavity volume, and hypoalbuminemia are independent risk factors that increase mortality. The duration of symptoms and the type of therapy given did not affect mortality [4,17].

#### 4. Conclusion

A common complication of amoebiasis is a liver abscess, while amoebiasis empyema is very rare. Serological testing and radiological examination will be more useful in the early detection of cases of *Entamoeba histolytica* infection. The process of removing pus in the pleural cavity and liver abscess using a chest tube and percutaneous aspiration drainage guiding ultrasound for the abscess but failed. If the lung condition does not improve after thoracic drainage and the size of the liver abscess does not decrease, surgery may be selected. In this case, surgery and antibiotics have a good prognosis.

#### Author contribution

Putri Mega Juwita: collecting data, analysis, drafts, revisions, and supervision; Resti Yudhawati: methodology, analysis, drafting, review, submit, and revisions.

#### Consent

We have requested the patient's consent to publish this case report for educational purposes.

#### Funding

None.

#### Ethical approval

We have conducted an ethical approval base on the Declaration of Helsinki at Ethical Committee in Dr. Soetomo General Academic Hospital, Surabaya, Indonesia.

#### Guarantor

Resti Yudawati.

#### Research registration

Not applicable.

#### Provenance and peer review

Not commissioned, externally peer-reviewed.

#### Declaration of competing interest

The authors declare that they have no conflict of interest.

#### Acknowledgment

We would like to thank Fis Citra Ariyanto for helping us in the editing and proof process.

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