

1 **A rare case of hepatobronchial fistula from amebic liver abscess mimicking**  
2 **pulmonary tuberculosis**

3

4 *Suppachok Kirdlarp, MD<sup>1</sup>, Nitima Saksobhavit, MD<sup>2</sup>, Kumthorn Malathum, MD.<sup>1,\*</sup>*5 <sup>1</sup>Division of infectious diseases, Department of Medicine, Faculty of Medicine Ramathibodi  
6 Hospital, Mahidol University7 <sup>2</sup>Division of Emergency Radiology, Department of Diagnostic and Therapeutic Radiology, Faculty  
8 of Medicine Ramathibodi Hospital, Mahidol University

9

10 **\*Corresponding author:** Kumthorn Malathum, MD.11 Division of infectious diseases, Department of Medicine, Faculty of Medicine Ramathibodi  
12 Hospital, Mahidol University13 Email: [mkumthorn@yahoo.com](mailto:mkumthorn@yahoo.com)14 **Running title:** Hepatobronchial fistula from amebic liver abscess15 **Keywords:** amebiasis, hepatic abscess, *Entamoeba histolytica*, *Mycobacterium tuberculosis*, TB

16

17 **Abstract**18 We present a 51-year-old male with hemoptysis for 2 months. He had 10 kilograms of  
19 weight loss and low-grade fever. He was firstly suspected of tuberculosis or lung cancer. The  
20 physical examination showed moderate pale conjunctivae and decreased breath sound at right  
21 lower lung with crepitation. The chest radiography revealed abnormal opacity at the right lower  
22 lung field. A computed tomography of the chest and upper abdomen revealed a 7 cm, solitary-  
23 rim enhancing hypodense lesion at the right lobe of the liver and there was a fistula tract from  
24 the abscess into the lung parenchyma without pleural involvement. A bronchoscopy was  
25 performed and bronchoalveolar lavage fluid showed numerous white blood cells (WBC), red  
26 blood cells (RBC) and few Charcot-Leyden crystals. The antibody titer to *Entamoeba histolytica*  
27 was >1:1024. No cyst or trophozoite was demonstrated in the stool. He was successfully treated  
28 with metronidazole 750 mg intravenously every 8 hours for 10 days, and diiodohydroxyquin 625  
29 mg orally every 8 hours for 20 days. Percutaneous drainage of the abscess was performed. The

30 patient was discharged without any serious complication or disability. A follow-up CT of the chest  
31 and abdomen at the fourth week showed complete resolution of the abscess and consolidation.

32

### 33 **Introduction**

34 Amebiasis, caused by the protozoa *Entamoeba histolytica*, is one of the remaining causes  
35 of diarrhea in many developing countries. It also causes approximately 100,000 deaths worldwide  
36 each year. The incidence of amebiasis in Thailand has dramatically decreased due to better  
37 sanitation and now it is unfamiliar to a large number of physicians<sup>2</sup>. Although amebic infections  
38 are mostly asymptomatic, there are an intestinal form called amebic dysentery and the  
39 extrahepatic form. Amebic liver abscess is one of the most common types of extrahepatic  
40 manifestations. Ruptured liver abscess is a major complication which can cause various  
41 symptoms depending on which organ is involved<sup>3</sup>. We report our case that had a pulmonary  
42 complication from an amebic liver abscess.

### 43 **Case presentation**

44 A 51-year-old Thai man living in Samut Prakarn province, the central part of Thailand,  
45 came to the hospital due to productive cough and low-grade fever for two months. His sputum  
46 was brownish with blood streak (figure 1.). He denied any abdominal pain or diarrheal symptoms.  
47 He lost 10 kilograms within two months. He denied smoking and alcohol consumption. He went  
48 to a private hospital and was suspected of pulmonary infection, especially pulmonary  
49 tuberculosis or bacterial pneumonia. The acid-fast bacilli (AFB) smear was negative for three days  
50 consecutively. He was treated for bacterial pneumonia, but he did not improve. He was  
51 transferred to Ramathibodi hospital for further investigation. Upon physical examination, his  
52 temperature was 37.1 degree Celsius. His Blood pressure and pulse rates were 130/80 mmHg  
53 and 108 beats per minute, respectively. His respiratory rate was 22 times per minute. His breath  
54 sound was decreased at the right lower lung field, and a crepitation area was detected at that  
55 area. He had moderately pale conjunctivae and anicteric sclerae. His liver span was 10 cm, and  
56 fist test was negative. No lymph node enlargement was detected. The physical examination  
57 otherwise was unremarkable. His hematocrit was 23.3 % and hemoglobin concentration was 7.2  
58 g/dL, mean corpuscular volume (MCV) was 76 fL and platelets were 1,118,000/mm<sup>3</sup>, serum iron

59 was 14 mcg/dL (normal range: 35-150) and total iron binding capacity (TIBC) was 144 mcg/dL  
60 (normal range: 250-450), consistent with iron deficiency anemia. Aspartate aminotransferase  
61 (AST) and alanine aminotransferase (ALT) were 46 u/L (normal range: 5-34) and 113 u/L (normal  
62 range: 0-55), respectively. Alkaline phosphatase (ALP) and Gamma-glutamyl transferase (GGT)  
63 were 330 u/L (normal range: 40-150) and 468 u/L (normal range: 12-64). The total and direct  
64 bilirubin were in normal ranges. His electrolytes and renal function were within normal limits. A  
65 plain chest radiography revealed abnormal opacity at the right lower lung field. (figure2) The  
66 initial diagnosis was chronic pneumonitis with a suspected space taking lesion at the liver. He was  
67 admitted and the infectious disease team was consulted afterward. The computed tomography  
68 of the chest and upper abdomen showed a solitary large rim-enhancing hypodense lesion at the  
69 subdiaphragmatic region of hepatic segment VII of about 7.0x6.6x6.8 cm, connecting to the  
70 consolidation of the right lower pulmonary lobe without pleural effusion (figure 3). Fecal  
71 examination showed no *E. histolytica* cyst and trophozoites, and the *E. histolytica* antibody titer  
72 was >1:1024. The pulmonary team was consulted and a bronchoscopy was performed.  
73 Bronchoalveolar lavage revealed numerous red blood cells and white blood cells with a Charcot-  
74 Leyden crystal (figure 4), suggesting a connection to the abscess in the liver forming a  
75 hepatobronchial fistula. The patient received metronidazole 750 mg intravenously every 8 hours  
76 for ten days and diiodohydroxyquin 625 mg orally every 8 hours for 21 days. Within 48 hours  
77 after treatment, his cough had dramatically decreased. He also underwent percutaneous  
78 drainage of the liver abscess, and the anchovy-like pus was largely drained (figure 5). The culture  
79 of the pus grew no bacterial pathogens. Four weeks after discharge, he came to follow up at the  
80 outpatient clinic and was found to have complete resolution of the abscess and lung  
81 consolidation.

## 82 Discussion

83 Amebiasis caused by *E. histolytica* used to be a common parasitic infection of the  
84 gastrointestinal tract and liver in many parts of the world. However, with improved sanitation in  
85 the current world, the disease has almost disappeared to the extent that many physicians are  
86 now unfamiliar. Diagnosis therefore may be delayed <sup>1</sup>.

87 Ingestion of a cyst of *E. histolytica* from contaminated food or water leads to infection.  
88 After the cysts have migrated into the intestinal lumen, excystation of trophozoites occurs <sup>4</sup>.  
89 Infection may be asymptomatic or lead to dysentery or extraintestinal disease. Asymptomatic  
90 infection should be treated because it can potentially become an invasive disease. Colitis occurs  
91 when the trophozoite penetrates the intestinal mucus layer. Amebic liver abscess is the most  
92 common extraintestinal manifestation of amebiasis occurring by migration of the parasite via the  
93 portal venous system <sup>4</sup>. Amebic liver abscess is ten times more common among adult males than  
94 females, especially in 4<sup>th</sup> to 5<sup>th</sup> decades of life <sup>5</sup>. Risk of amebic liver abscess includes  
95 immunocompromised state such as HIV infection, alcoholism, poor hygiene and sanitation. <sup>5</sup> The  
96 clinical symptoms usually occur in 8 to 20 weeks. Common symptoms are fever accompanied by  
97 right upper quadrant abdominal pain for 1 to 2 weeks. The pain can also refer to epigastrium or  
98 chest. The constitutional symptoms, e.g. night sweats, weight loss, anorexia, fatigue, or cough  
99 may be observed. Only about one-third of all patients with amebic liver abscess also have a  
100 history of dysentery and half of all patients have hepatomegaly and liver tenderness. <sup>1, 3, 6</sup>  
101 Ultrasonography, computed tomography, and magnetic resonance imaging are the investigations  
102 of choice for detecting liver lesions, which is typically shown as a single lesion in the right lobe <sup>7</sup>.  
103 Rupture of liver abscess is the complication that may involve an adjacent organ such as the  
104 peritoneum, lung, pleura or pericardium. <sup>3</sup>

105 Pulmonary involvement of amebiasis is a relatively rare complication of amebic liver  
106 abscess. The most common form is amebic empyema resulting from rupture of the abscess into  
107 pleural space <sup>7</sup>. Hepatobronchial fistula due to direct invasion of the parasite into lung  
108 parenchyma occurs through diaphragmatic disruption without spreading into the pleura in 5.2 %  
109 of cases <sup>8</sup>. The patient may have a chronic cough that mimics tuberculosis or lung cancer and the  
110 patient can cough very frequently because of copious amounts of pus. The expectorated sputum  
111 may contain dark anchovy sauce-like material.

112 There are several methods to make the diagnosis. Grossly, pus from the liver typically has  
113 anchovy-like color derived predominantly from necrotic hepatocytes; it mostly composes of  
114 acellular, large proteinaceous debris, very few visible neutrophils and Charcot-Layden crystal.  
115 Trophozoites are seen on microscopy of the aspirate in fewer than 20 % of cases. Microscopic

116 examination for stool or abscess is less sensitive for the diagnosis. Cysts may be observed in only  
117 10-40% of stool and less than 20% in abscess fluid. Serologic test is also used to confirm the  
118 diagnosis. During the early phase of the disease, serum anti-amebic antibody by indirect  
119 hemagglutination can be detected in 70 to 80% of the cases and up to more than 90% in the  
120 convalescence phase <sup>1,9</sup>.

121 Treatment is mainly medical. Anti-amebic of choice is metronidazole 750 mg  
122 intravenously or orally every 8 hours for ten days as tissue ameobicide. The intestinal luminal  
123 cyst should be treated with paromomycin 25-35mg/kg/day divided into 3 doses for 7 days or  
124 hydroxyquinoline derivatives, e.g. iodoquinol or so-called diiodohydroxyquin 40mg/kg/day  
125 divided in 3 dosed for 20 days <sup>10</sup>. Percutaneous or surgical drainage may be needed if the risk of  
126 rupture is high, i.e., size > 5 cm in diameter, abscess at left lobe or poor response to antibiotics <sup>1,</sup>  
127 <sup>6, 11</sup>. Percutaneous drainage is preferred to needle aspiration because of earlier clinical  
128 improvement and shorter time to 50% reduction in the size of the abscess cavity, but with no  
129 significant advantage in terms of hospitalization days. <sup>12-14</sup> In general, amebic pleural effusions  
130 should be aspirated.

131 Although amebiasis is now rarely seen in Thailand, the diagnosis is in fact not very difficult,  
132 as most patients would have typical presentation of a single liver abscess in the right lobe with  
133 or without history of diarrhea. Microscopic examination of pus, stool and serologic testing will  
134 lead to a correct diagnosis, and subsequent appropriate treatment can be given in a timely  
135 manner. Once treated, the patient will recover rapidly. Therefore, physicians should be aware of  
136 this entity when encountering patients presenting with symptoms and signs as shown in our case.

137

138

139 **References**

- 140 1. Haque R, Huston CD, Hughes M, Houpt E, Petri WA. Amebiasis. *New England Journal of*  
141 *Medicine*. 2003;348(16):1565-73.
- 142 2. Ximénez C, Morán P, Rojas L, Valadez A, Gómez A, Ramiro M, et al. Novelties on amoebiasis: a  
143 neglected tropical disease. *Journal of global infectious diseases*. 2011;3(2):166-74.
- 144 3. Greaney GC, Reynolds TB, Donovan AJ. Ruptured Amebic Liver Abscess. *Archives of Surgery*.  
145 1985;120(5):555-61.
- 146 4. Aikat BK, Bhusnurmath SR, Pal AK, Chhuttani PN, Datta DV. The pathology and pathogenesis of  
147 fatal hepatic amoebiasis--A study based on 79 autopsy cases. *Transactions of the Royal Society of*  
148 *Tropical Medicine and Hygiene*. 1979;73(2):188-92.
- 149 5. Park WB, Choe PG, Jo JH, Kim SH, Bang JH, Kim HB, et al. Amebic liver abscess in HIV-infected  
150 patients, Republic of Korea. *Emerging infectious diseases*. 2007;13(3):516-7.
- 151 6. Stanley SL, Jr. Amoebiasis. *The Lancet*. 2003;361(9362):1025-34.
- 152 7. Böni RAH, Peter J, Marincek B. Amebic abscess of the liver manifested by "hemoptysis": US, CT,  
153 and MRI findings. *Abdominal Imaging*. 1995;20(3):214-6.
- 154 8. Michels AG, Van Ordstrand HS, Collins EN. Amoebic hepatic abscess with bronchohepatic fistula;  
155 report of a case. *Cleveland Clinic quarterly*. 1949;16(3):142-7.
- 156 9. Wiwanitkit V. A note on indirect hemagglutination (IHA) antibody titers among hospitalized  
157 patients in Thailand with amebic liver abscesses. *MedGenMed : Medscape general medicine*.  
158 2002;4(3):5.
- 159 10. Gonzales MLM, Dans LF, Sio-Aguilar J. Antiamoebic drugs for treating amoebic colitis. *Cochrane*  
160 *Database of Systematic Reviews*. 2019(1).
- 161 11. Kale S, Nanavati AJ, Borle N, Nagral S. Outcomes of a conservative approach to management in  
162 amoebic liver abscess. *Journal of postgraduate medicine*. 2017;63(1):16-20.
- 163 12. Singh S, Chaudhary P, Saxena N, Khandelwal S, Poddar DD, Biswal UC. Treatment of liver  
164 abscess: prospective randomized comparison of catheter drainage and needle aspiration. *Annals of*  
165 *gastroenterology*. 2013;26(4):332-9.
- 166 13. Saraswat VA, Agarwal DK, Baijal SS, Roy S, Choudhuri G, Dhiman RK, et al. Percutaneous catheter  
167 drainage of amoebic liver abscess. *Clinical Radiology*. 1992;45(3):187-9.
- 168 14. Stables GI, Irving HC, Simmons AV, Walker BE. Case report: Hepatobronchial fistula complicating  
169 amoebiasis, treated by percutaneous catheter drainage. *Clinical Radiology*. 1991;44(5):354-6.

170

171

172

173

174

175

176

177

178

179

180 **Figure 1:** Sputum demonstrates anchovy-like material.

181

182

183

184

185

186

187

188

189

190

191

192



193 **Figure 2. Left:** chest radiography shows right basal lung infiltration; **Right:** the CT chest coronal  
194 view shows the fistula tract connecting to lung parenchyma.

CASE REPORT SAMPLE

195

196

197

198

199

200

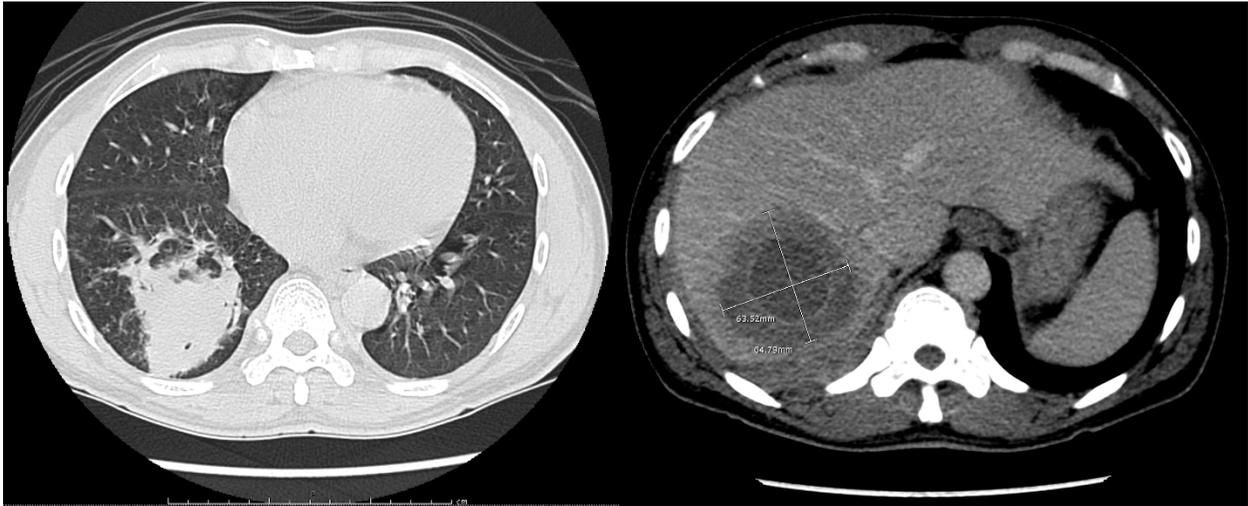
201

202

203

204

205



206 **Figure 3.** CT chest and upper abdomen show a solitary rim-enhancing hypodense lesion at right  
207 lobe of liver with right lower lung consolidation.

208

209

210

211

212

213

214

215

216

217

218

219



220 **Figure 4.** Bronchoalveolar lavage shows numerous WBC, RBC with a Charcot-Leyden crystal  
221 (arrow).

222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233



**Figure 5.** Liver abscess derived from percutaneous drainage shows the brownish anchovy-like pus.

CASE REPORT SAMPLE