



Case Report

Primary pulmonary amoebiasis complicated with right-sided pneumothorax and multicystic empyema: A case report

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Abstract

Amoebiasis is the most common parasitic infection caused by the protozoan *Entamoeba histolytica*. Around 90% of the infections are asymptomatic, and in the majority of the cases, the common clinical manifestation is amoebic dysentery. The most common site of extraintestinal invasion is the liver, and in some rare cases, amoebiasis can affect the brain, heart, spleen, and lungs. Here we present a case of a 38-year-old female patient with a complaint of dyspnea and fever since 1 week. The chest X-ray (PA view) revealed right-sided pneumothorax with mediastinal shift. A CT scan revealed a thin-walled, well-defined lesion in the bilateral posterior costal pleura. A cavitory lesion was noted in the right upper lobe. CT-guided percutaneous aspiration drainage was done. The wet mount preparation of aspirated fluid showed trophozoites with pseudopodia and few cysts. An integrated approach is required for diagnosing pulmonary amoebiasis, which includes clinical manifestations, radiological findings and microscopic investigation. Amoebiasis is treatable, but early diagnosis is imperative to reduce morbidity and mortality.

Keywords: Pulmonary amoebiasis, Protozoan, *Entamoeba histolytica*

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1. Introduction

Amoebiasis is third most common parasitic cause of death worldwide after malaria and schistosomiasis.¹ Globally around 40 to 50 million people develop amoebic colitis with 40,000 death annually. The prevalence is more among developing countries because of poor sanitation, inadequate hygiene practices, malnourishment and poor socioeconomic conditions.^{2,3} In India the prevalence rate is approximately 15% ranging from 3.6% to 47.4%. The risk of developing extraintestinal amoebiasis increases in immunocompromised patients such as those with HIV infection.^{3,4}

Amoebiasis affecting lung and pleural tissues is the second most common presentation of extra intestinal amoebiasis. The parasite *Entamoeba histolytica* enters into lung tissues by either of the following routes: rupture of lung abscess (10.4%), hematogenous route without involvement

of liver (14.3%), Empyema extending from liver (17.6%), through bronchopleural fistula (19.6%) and liver abscess (37.2%).³ Most patients develop pleuropulmonary amoebiasis due to rupture of an amoebic liver abscess into pleural space. The second most common route is hematogenous spread directly from large intestine via the hemorrhoidal vein, superior mesenteric veins, and inferior vena cava into pleural cavity without hepatic involvement. In pulmonary amoebiasis inferior and medial lobes of right lungs are most commonly affected.⁵

The X-ray findings of pulmonary amoebiasis include right lobe cavitation with homogenous opacity, with or without pleural effusion and elevated right hemidiaphragm.^{3,10} In about 62.5% cases pleural effusion occurs. Hydropneumothorax is seen in patient with bronchopleural fistula.^{11,12} X-ray along with different radiological modalities such as CT scan, MRI scan and chest

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ultrasonography shows excellent sensitivity. USG can also be used to monitor prognosis of patient with extra-intestinal amoebiasis.^{13,14} Pulmonary amoebiasis is often misdiagnosed due to late presentation of disease, poor exposure of physicians, negligence of parasitic infection and limited modalities for its diagnosis.^{6,7}

2. Case Presentation

A 38 year old female patient farmer by occupation came to Dhiraj hospital with chief complaint of dyspnea and fever since one week. On detailed examination we found that breathlessness scaled upto Grade IV mMRC (Modified Medical Research Council). She suffered from paroxysmal nocturnal dyspnea with no seasonal or diurnal variation. The patient had complained of loss of appetite, nausea and generalized weakness since one week. The patient suffered from mild, dull aching, intermittent, generalized abdominal pain which was not radiating in nature. The patient had history of similar complaint and was treated symptomatically at local hospital. The patient had no family history of hypertension, diabetes mellitus and COVID-19. On clinical examination patient was conscious, well oriented to time, place and person. Vital signs were as follows: temperature (98.9 ° F), pulse 102 bpm, respiratory rate 22 bpm, blood pressure 116/80 mmHg and O₂ of 98% on room air. On inspection bulging over right side of chest was noticed. Chest examination revealed significant decreased air entry and tactile vocal fremitus with crepitation on right side with normal heart sounds with no murmur or rubs or gallops. Her abdomen was soft, non-tender with no evidence of organomegaly. On palpation, the trachea was shifted towards left side.

2.1. Radiological findings

Abdomen ultrasound showed no evidence of obvious gross liver pathology. The chest X ray (PA View) revealed right sided pneumothorax with mediastinal shift. The homogenous opacity on left lower zone was noticed. CT scan showed early emphysematous changes. Thin walled, round to oval, well defined fluid density lesions showing thin rim of peripheral enhancement with surrounding ground glass opacity were noted in bilateral posterior costal pleura of size measuring approximately 32 x 52 x 39 mm on right side and approximately 48 x 50 x 43 mm on left side. Another similar characteristic lesion of size approximately 19x19x16 mm was noted in right upper lobe with distal consolidatory area. A cavitory lesion of size approximately 21 x 36 x 22 mm was noted in right upper lobe. A pneumothorax was noted on right side. Subcutaneous emphysema was noted in right axillary region.

2.2. Sample collection and laboratory diagnosis

A CT-guided percutaneous aspiration drainage was done. Aspirated material was sent to the diagnostic microbiology laboratory. The wet mount and iodine mount were performed. The wet mount preparation showed the trophozoite of

Entamoeba histolytica with pseudopodia and few cystic stages. No acid-fast bacilli were detected in ZN stain. No fungal hyphae were seen in the KOH mount. Aerobic and anaerobic bacterial cultures were negative. Stool examination was negative for *Entamoeba* cyst or trophozoites. Serological tests were not performed due to unavailability. (Figure 1, Figure 2)

2.3. Treatment

After the final diagnosis of pulmonary amoebiasis, the patient was administered metronidazole 750 mg intravenously thrice a day for 10 days. Patient's clinical condition significantly improved after thoracotomy with surgical drainage and with start of metronidazole.



Figure 1: CT scan showing right sided pneumothorax with cavitory lesion

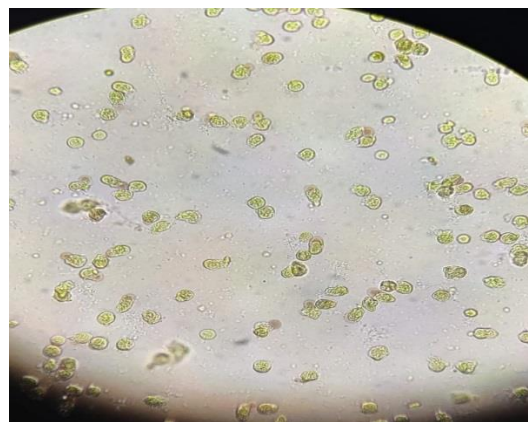


Figure 2: Iodine preparation of aspirated sample

3. Discussion

Amoebiasis caused by the protozoan *Entamoeba histolytica* is the third most common parasitic infection affecting around 40 to 50 million people with 40,000 death annually.^{1,2} The prevalence of amoebiasis is high among tropical and subtropical countries due to poor socioeconomic and sanitary conditions.³

In the majority of cases *Entamoeba* infections are asymptomatic. Factors that affect invasiveness of disease depend upon the virulence of *E. histolytica* strain, genetic predisposition and immune status of the person.⁴

Clinical manifestation of intestinal amoebiasis ranges from mild diarrhea to severe dysentery with fulminant amoebic colitis. The most common extraintestinal disease can occur in form of liver abscess and rarely as cardiac, pulmonary and brain amoebiasis.⁵ In case of amoebic liver abscess aspirated fluid is reddish brown in colour giving appearance of 'anchovy sauce'.⁷

Pleuropulmonary amoebiasis is second most common complication of extraintestinal disease which occurs in around 7-20% of patients. Pulmonary amoebiasis can occur via two routes first by direct rupture of amoebic liver abscess through diaphragm or secondly by hematogenous and lymphatic spread from intestinal lesion.⁶ The most common

presentation in pulmonary amoebiasis is localized pleuritic pain in right upper lobe, haemoptysis, cough and dyspnea.^{5,7} In the present case, the patient presented with chief complaint of dyspnea since one week which was worsening day by day.

Pleuropulmonary amoebiasis is often misdiagnosed and easily confused with other clinical conditions such as pulmonary tuberculosis, bacterial abscess, carcinoma and other parasitic infections.^{1,8} Thus for confirmation of pulmonary amoebiasis combined approach including radiological imaging and microscopic findings supplemented with serological testing is required. In radiographic imaging homogenous opacity or cavitory lesion are seen in right lower and middle lobes with elevated hemidiaphragm along with pleural effusions.^{2,3} In our case, chest X-ray showed right sided pneumothorax with mediastinal shift. And in CT scan well defined cavitory lesions were noticed on both sides.

Table 1: Comparison of various studies

	Present case	Andika Chandra Putra et al¹	Zakaria A et al⁴	Yuan-Yuan Liu et al²
Patient Demographics				
Age (years)	38 years	40 years	24 years	68 years
Sex (M/F)	Female	Male	Male	Male
Clinical Presentation				
Symptoms	Dyspnea and fever	Cough, shortness of breath, and fever.	Fever, productive cough, shortness of breath, and right -side chest pain	Dry cough, without fever, chest pain, haemoptysis
Duration of Symptoms (days/weeks)	One week	1 month	10 days	1 month
Comorbidities	None	HIV positive	Down syndrome	Lung adenocarcinoma
Radiological Findings				
Chest X-ray (CXR) Findings	Right sided pneumothorax with mediastinal shift	Left paracardial consolidation	Right sided obliteration of costophrenic angle and displaced right lung	--
CT Scan Findings	Well-defined fluid density lesions on both sides	Cystic areas with air-fluid levels in left lung parenchyma	Right sided pleural effusion and partial atelectasis of right middle and lower lobes	Right upper lobe nodules
Laboratory Findings	Wet mount preparation of aspirated material showed trophozoite of <i>Entamoeba histolytica</i> with pseudopodia and few cystic stages	Histopathological investigation of left lung biopsy revealed amoebic trophozoites	Microscopic examination of both pleural fluid and bronchoalveolar lavage sample revealed <i>Entamoeba</i> cysts and trophozoites	Histopathological examination of lung tissue biopsy revealed amoeba trophozoites

Light microscopy is rapid and effective way for diagnosis of amoebiasis in which characteristic trophozoites and cyst are seen. The main limitation of microscopic examination is that despite repeated sample examinations parasitic forms are not seen as organisms may appear intermittently which may misguide the diagnosis. Various immunological test are available such as rapid serological test and ELISA assay which detects antibodies and are highly sensitive tests.⁸ But the main disadvantage of serological tests is that they cannot differentiate between recent and past infections. New serological tests are available based on recombinant antigen of *Entamoeba histolytica* which are especially useful in endemic areas with high prevalence. The triage parasitic panel is available which simultaneously detects *Entamoeba histolytica*, *Giardia lamblia* and *Cryptosporidium parvum*.^{4,5}

The mortality rate of amoebic empyema is as high as 16%, thus such cases requires urgent chest tube thoracostomy with decortication.^{7,8} The drug regime for amoebiasis consists of 750mg Metronidazole orally thrice daily for 7 to 10 days or alternatively tinidazole 2gm once daily for 5 days. Most of patient respond very well to single course of treatment with metronidazole with complete resolution of symptoms but in some cases, luminal drugs such as paromomycin, diloxanide furoate are added to eliminate intraluminal cysts.^{1,2}

4. Limitations

4.1. Lack of molecular methods for further species identification

E. histolytica is indistinguishable morphologically from other species like *E. dispar*, *E. moshkovskii*, and *E. bangladeshi* but it can be distinguished from other non-pathogenic amoebas such as *E. coli*, *E. hartmanni*, *Endolimax nana*, and *Iodamoeba bütschlii* through microscopic examination. Thus molecular assays and other enzyme immunoassay are required to further differentiate *E. histolytica* from other amoebas.

4.2. Unavailability of serological tests

The serological tests were not available which could have aid in confirmation of clinical diagnosis. The present diagnosis was made solely based on microscopic examination along with radiological findings.

4.3. Lack of long-term follow up

Follow up of patient was not done after discharge. Long term follow up is required in case of extraintestinal amoebiasis as it might lead to invasion at different site.

4.4. Lack of surveillance

In present study, community survey was not carried out to trace source of contamination which could have helped in controlling further spread of disease.

5. Conclusion

This case report explores primary pulmonary amoebiasis without hepatic involvement which is uncommon presentation. A multidisciplinary approach including radiological imaging and microscopic examination was carried out for final diagnosis. The patient was successfully treated with antiparasitic drug and surgical drainage. Thus early diagnosis and appropriate treatment is required for management of extraintestinal amoebiasis to reduce morbidity and mortality. Proper surveillance has to be carried out to study local epidemiological pattern of parasitic infection.

6. Ethical Approval

The appropriate written informed consent was obtained for publication of case report and accompanying images. No objection certificate (NOC) was issued by institutional ethics committee (SVIEC/ON/MEDI/RP/NOC/25/53) for publication.

7. Source of Funding

None.

8. Conflict of Interest

None

References

- Andika CP, Bernadina C, Emon W, Maisie J, Albertus AP, Renaningtyas T, et al. Primary pulmonary amoebiasis mimicking lung tumour in immunocompromised patient: A case report. *Respirol Case Rep*. 2023;11(8): e01199
- Yuan-Yuan L, Yue Y, Chong C, Yue-Kai H, Fei-Fei Y, Ling-Yun S, et al. Primary pulmonary amebic abscess in a patient with pulmonary adenocarcinoma: a case report. *Infect Dis Poverty*. 2018;7:34
- Dewi K, Suci Y, Dewi I, Iswanto I. Pulmonary amebiasis complicated with massive left empyema and respiratory failure: a case report. *Sanamed [Internet]*. 2020;15(1):45–9
- Zakaria A, Al-Share B, Al AK. Primary pulmonary amebiasis complicated with multicystic empyema. *Case Rep Pulmonol*. 2016;2016:8709347.
- Nakada-Tsukui K, Nozaki T. Immune response of amebiasis and immune evasion by *Entamoeba histolytica*. *Front Immunol*. 2016;7:175.
- Putra AC, Chyntia B, Winardi E, Johan M, Pradwiyanto AA, Tambun R, et al. Primary pulmonary amoebiasis mimicking lung tumour in immunocompromised patient: A case report. *Respir Case Rep*. 2023;11(8):e01199. DOI:10.1002/rcr2.1199
- Micaella K, Anarella A, Andrea E, Alan S, Jose T, Jose G, et al. *Entamoeba histolytica*: Updates in Clinical Manifestation, Pathogenesis, and Vaccine Development. *Can J Gastroenterol Hepatol*. 2018:4601420.
- Fotedar R, Stark D, Beebe N, Marriott D, Ellis J, Harkness J. Laboratory diagnostic techniques for *Entamoeba* species. *Clin Microbiol Rev*. 2007;20(3):511-32.
- Al-Tawfiq JA, Kim H, Memish ZA, Parasitic lung diseases. *Eur Respir Rev*. 2022 Nov 29;31(166):220093.
- Sánchez Zamora P, Gallotti AC, Ramos R, Ligeró López J, González Y, Mejía RA, et al. An Unexpected Case of Disseminated Amebiasis with Cerebral Involvement and Successful Recovery in a Non-Endemic Context. *Am J Case Rep*. 2021;22:e934188

11. Liu Y, Ying Y, Chen C, Hu Y, Yang F, Shao L, et al. Primary pulmonary amebic abscess in a patient with pulmonary adenocarcinoma: a case report. *Infect Dis Poverty*. 2018;7(1):34
12. Danny Darlington C, Fatima Shirly Anitha G. Ruptured amoebic liver abscess with empyema thoracis - a case report. *Int Surg J*. 2017;4(5):1801–2.
13. Nasrullah A, Haq S, Ghazanfar H, Sheikh AB, Akhtar A, Zafar R et al. A unique case of empyema secondary to amoebic liver abscess. *Cureus*. 2017;9(6): e1377.
14. Putri Mega Juwita, Resti Yudhawati, Secondary pleuropulmonary amoebiasis due to liver abscess rupture: A complication case report in low resource setting. *Int J Surg Case Rep*. 2021;85:106231,
15. Ximénez C, Morán P, Rojas L, Valadez A, Gómez A, Ramiro M. et al. Novelty on amoebiasis: a neglected tropical disease. *J Global Infect. Dis*. 2011:166-74

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