MAGNA MEDIKA
Berkala Ilmiah Kedokteran dan Kesehatan
e-ISSN 2774-2318
p-ISSN 2407-0505


Case Report
MAGNA MEDIKA
Berkala Ilmiah Kedokteran dan Kesehatan
Journal Page: https://jurnal.unimus.ac.id/index.php/APKKM

# Pleural Amebiasis without Hepar Involvement

**Friska Handayani[1], Irvan Medison[2], Dewi Wahyu Fitrina[3], Dessy Mizarti [4]**

[1,2,3,4] Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Andalas University, Padang, Indonesia

**Article Info**

**Article history:**
Received 04 February 2023
Revised 18 April 2023
Accepted 26 April 2023
Available online 13 August 2023

**Keywords:**
liver; pleural amebiasis; pleuropulmonary

**Correspondence:**
friskarozi@gmail.com

**How to cite this article:**
Handayani F, Medison I, Fitrina DW, Mizarti D. Pleural Amebiasis Without Hepar Involvement. MAGNA MEDIKA Berk Ilm Kedokt dan Kesehat. 2023; 10 (2): 229-238

**Abstract**

**Background:** Pleuropulmonary amebiasis is the most common complication of amoebic liver abscess, occurring in 15% of patients with amoebic liver disease and 1% of patients with amoebic dysentery. Most commonly occurs by direct extension of a right superior lobe hepatic abscess through the diaphragm to the right lower lobe of the lung, with a mortality rate of 5-16%. Primary pleural amebiasis without liver involvement is rare.

**Case Presentation:** Reported an 18-year-old male patient with pleural amebiasis from a parasitological examination of pleural fluid found Entamoeba histolytica. History, physical examination, and support showed normal liver function. The patient has a history of poor sanitation with a dissertation of unhygienic habits. Patients without liver problems remain at risk for amoebiasis pleura.

**Conclusion:** Pleural amebiasis without liver involvement was a rare case. Further investigation was needed in patients with pleural amoebiasis to other organs, such as the liver and digestive tract. Diagnosing pleural amebiasis should be the main focus in determining the etiology. Entamoeba histolytica may be involved in pleural inflammation and cause effusion.

e-ISSN 2774-2318
p-ISSN 2407-0505

## INTRODUCTION

Pulmonary amebiasis was the second most common extraintestinal infection, usually invading the pleura. The incidence of pulmonary amebiasis reached 2-3%.[1] Giron study that pulmonary amebiasis was associated with poor socio-economic conditions and sanitation levels. 90% of amebiasis infections are asymptomatic. [2] The remaining 10% produce a spectrum of clinical syndromes, ranging from dysentery to liver or other organ abscessses, such as the lungs.[3] Visnu study that the incidence of amebiasis in Indonesia was high, between 10-18%, with a Crude Fatality Rate (CFR) ranging from 1.9% to 9.1%.[4] Entamoeba's most common causes of death were extraintestinal causes, including abscesses in the liver, pleura, lung, brain, pericardium, and urinary tract. Parasitic disease mortality due to amebiasis ranks third after malaria and schistosomiasis.[5]

Pleuropulmonary amoebiasis was the most common complication of amoebic liver abscess. It occurred in 15% of patients with amoebic liver disease and 1% with dysentery.[6] Most commonly occurs by direct extension of a right superior lobe hepatic abscess through the diaphragm to the right lower lobe of the lung, with a mortality rate of 5-16%.[7] Primary pleural amoebiasis without hepatic involvement is a rare event. It is thought to occur due to hematogenous spread from the origin, the colon. This condition made the authors interested in making a case report. The purpose of this case report is to describe a rare complication in the organs involved due to *Entamoeba histolytica*. Research ethics code number: 566/KEPK/2022 from the Health Care Ethic Committee.

## CASE PRESENTATION

An 18-year-old male patient was admitted to the Emergency room with chief complaints of breathlessness one day ago; breathlessness did not decrease. Shortness increases with activity and coughing. Shortness of breath had started to be felt one week earlier. The cough had increased two days ago. The cough was intermittent with yellowish phlegm. The cough had started to be felt one month ago. The patient complained of a fever two weeks ago. The fever was not too high and not followed by night sweats. He was coughing up blood and had no history of coughing up blood. The patient complained of right chest pain two days ago. It did not radiate and was not affected by activity. The patient did not feel a decrease in appetite or weight loss. Gastrointestinal complaints were not felt when the patient was treated, but two weeks earlier, the patient complained of diarrhea with abdominal pain.

The patient was a student who lived in Padang City. He lived in a permanent house, drinking water from the municipal services. History of trauma absent on the chest wall. Neither does the patient receive tuberculosis (TB) treatment. The patient started smoking two years ago with 5-10 sticks daily. The patient eats out more often.

Physical examination of the patient looked moderately ill with full cooperative awareness, blood pressure 110/70 mmHg, pulse 110 x/minute, breathing 27 x/minute, temperature 36.8 ℃ and O2 saturation 95% room air, giv-

e-ISSN 2774-2318
p-ISSN 2407-0505

en therapy with three nasal cannulas liters per minute (lpm). The patient has a body mass index (BMI) of 19.53, a body weight of 50 kg, and a height of 160 cm. Examination of the eyes and neck was within normal limits, with no enlarged lymph nodes in the neck, and the jugular vein pressure (JVP) was within normal limits.

Examination of the thorax in the patient, by inspection, did not show any injury. The right chest wall looks more convex than the left, and when dynamic, it appears that the movement of the right chest wall lags behind the left. Palpation found the left fremitus weaker than the right. Percussion of the upper right chest to intercostal space V is hyper resonant and dim. Meanwhile, the percussion of the left chest sounded resonant. Auscultation found right breath sounds to weaken until they disappeared—auscultation of the right chest, bronchovesicular breath sounds, crackles, and no wheezing. Examination of the liver did not reveal any hepatic tenderness or liver enlargement.

Results of routine blood tests are hemoglobin (Hb) 15 g/dl, leukocytes 15,910/mm$^3$, platelets 331,000/mm$^3$, hematocrit 44%, basophil type 0%, eosinophils 0%, neutrophils 85, lymphocytes 8%, monocytes 7%. PT check 11.1 seconds, APTT 24.1 seconds, D-dimer 347 ng/ml.

Clinical chemistry laboratory results, total protein 7.8 g/dl, albumin 3.9 g/dl, globulin 3.9 g/dl, total bilirubin 0.8 mg/dl, direct bilirubin 0.5 mg/dl, indirect bilirubin 0.3 mg/dl, SGOT 13 U/l, SGPT 8 U/l, blood urea 15 mg/dl, blood creatinine 0.8 mg/dl, fasting blood sugar 121 mg/dl, sodium 136 mmol/L, potassium 4.7 mmol/L, and chloride 98 mmol/L. The laboratory impression on the patient is the presence of leukocytosis.

Chest X-Ray shows an air-fluid level in the right hemithorax as high as the intercostal space (ICS) VIII anterior with a collapsed right lung and pushing in the contralateral direction in Figure 1. There is no abnormality in the left lung. The patient underwent a pleural proof procedure; ten ccs of hemorrhagic fluid was released and continued with a Water Sealed Drainage (WSD) installation.

The patient was diagnosed with Hydropneumothorax dextra et cause suspected pleural amebiasis and Community-Acquired Pneumonia (CAP). Differential diagnosis are Hemopneumothorax dextra with CAP and Hydropneumothorax dextra et cause Pulmonary TB with CAP.

Patients were given normal saline infusion therapy 12 hours/bag, ceftriaxone injection 1x2 gram intravenously (iv), levofloxacin infusion 1x750 mg (iv), metronidazole infusion 3x500mg (iv), n-acetylcysteine 2x200mg (oral). Patients are planned for pleural fluid analysis, serial routine blood tests, pleural fluid parasitology, pleural fluid culture, sputum culture, and GeneXpert TB.

Chest X-ray post-WSD installation in Figure 3b showed an avascular appearance with a pleural line. It is also seen as a homogeneous covering underneath the right hemithorax. WSD tip seen in right anterior intercostal space VI, compared to chest X-ray before WSD installation, a reduced hydropneumothorax was seen.

e-ISSN 2774-2318
p-ISSN 2407-0505

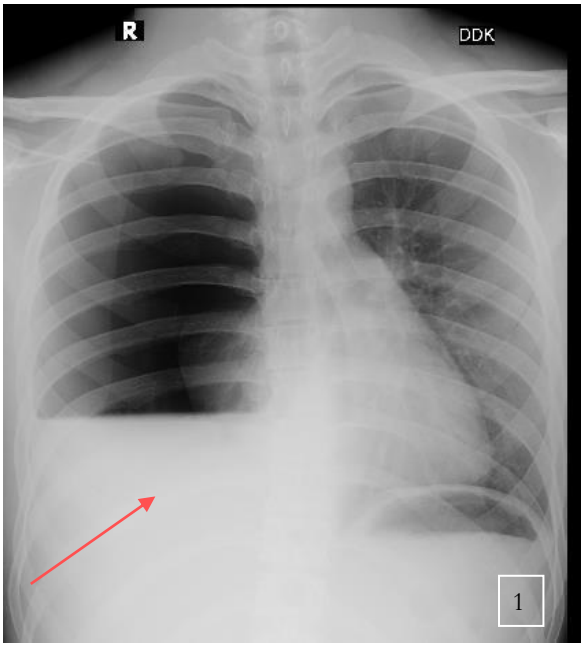



Figure 1. The first-day photograph of the chest x-ray. The red arrow shows an avascular hyperradiolucent section with a fluid water level indicating hydropneumothorax. Conclusion: right hydropneumothorax

Figure 2. Red pleural fluid in the ten cc syringe.

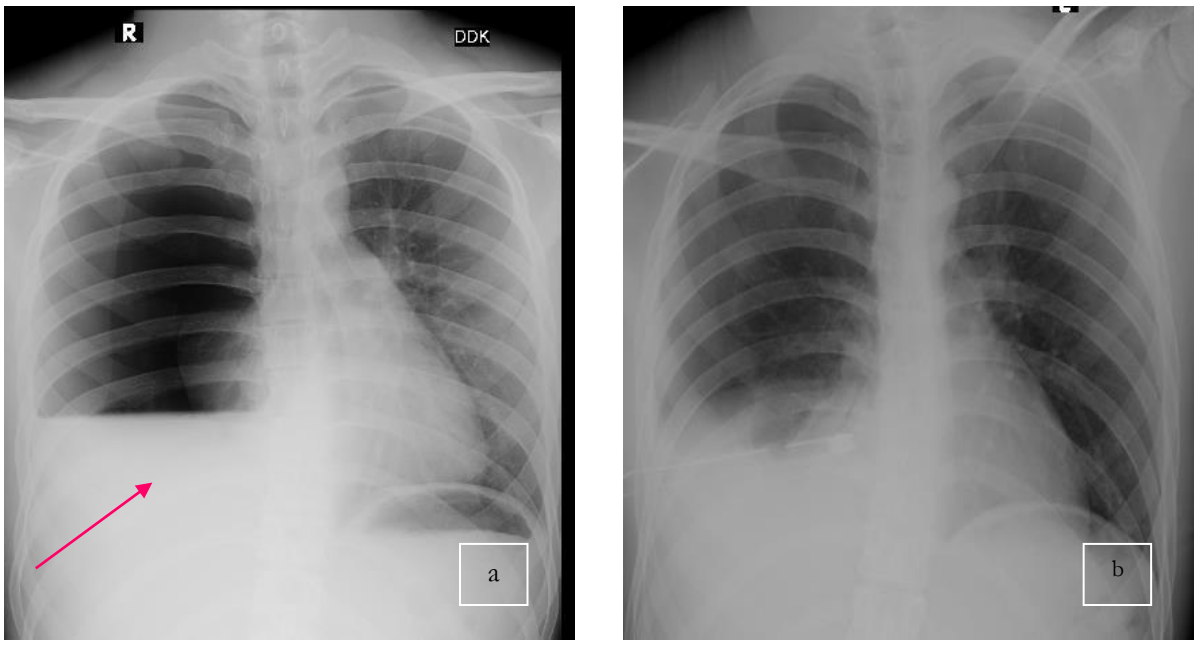


Figure 3. The second Chest X-Ray; a) before WSD installation, anad b) after WSD installation

Routine blood laboratory results on the second day of treatment, Hb 12.1 g/dl, leukocytes 17,090/mm$^3$, hematocrit 35%, and platelets 323,000/ul. The results of laboratory tests carried out 12 hours after WSD installation, compared with Hb before WSD installation (Hb 15 g/dl), showed a decrease. Currently, the total liquid in the WSD 1200 cc is hemorrhagic. The Vascular Consultant for Thoracic Surgery investigates right hemopneumothorax, and the Internal Medicine Consultant of Gastroenteric Hepatology investigates liver abscesses.


doi: 10.26714/magnamed.10.2.2023.229-238
10 (2) August 2023

e-ISSN 2774-2318
p-ISSN 2407-0505

The results of the pleural fluid analysis showed a cell count of 9,150, with 90% PMN and 10% MN. Clinical chemistry examination on pleural fluid protein 6.5 g/dl, LDH 281 $u$/l, glucose 34 g/dl, albumin 4.0 g/dl, and positive Rivalta. The light criteria for pleural fluid showed the impression of an acute exudative process. GeneXpert results show that Mycobacterium Tuberculosis was not detected.

On the second day of treatment, the WSD was in good condition with positive undulation, bubbles, and 650 cc of fluid coming out, and there were also no crepitations on the skin. The total liquid that comes out is 1500 cc. Answer from the Department of Thoracic and Cardiovascular Surgery, the patient is planned for Video-Assisted Thoracoscopy (VATS) if the patient's condition is stable. Blood tests on day 3 Hb 8.3 g/dl, leukocytes 7,100/mm$^3$, hematocrit 25%, and platelets 192,000/ul.

Patients were treated as additional by giving two packed red cell (PRC) units. Post transfusion of 2 units of PRC, blood tests were carried out with the results of Hb 10.7 g/dl, leukocytes 6,940/mm$^3$, hematocrit 31%, and platelets 305,000/ul. The impression from the results of laboratory tests is anemia improvement. The patient underwent an abdominal ultrasound on the fourth day of treatment, with results within normal limits.

On the sixth day of treatment, the patient's breathlessness decreased, and the intensity of the cough also decreased. Physical examination showed that breath sounds were heard on auscultation to the point of being musty, but at the base of the right lung, breath sounds were still heard, which were weak compared to the left. The patient underwent a chest X-Ray examination. The chest X-ray showed a right pleural effusion and no right pneumothorax.

The patient underwent exploratory VATS and tissue biopsy by Thoracic and Cardiovascular Surgery on the sixth day of hospitalization. Post Action, the patient is treated at the HCU and is monitored for vital signs, and the WSD was installed correctly. Parasitology culture examination at the parasitology unit from the pleural fluid showed the presence of *Entamoeba histolytica* in the pleural fluid. Histopathological results of tissue biopsy of the pleura showed a non-specific chronic inflammation.

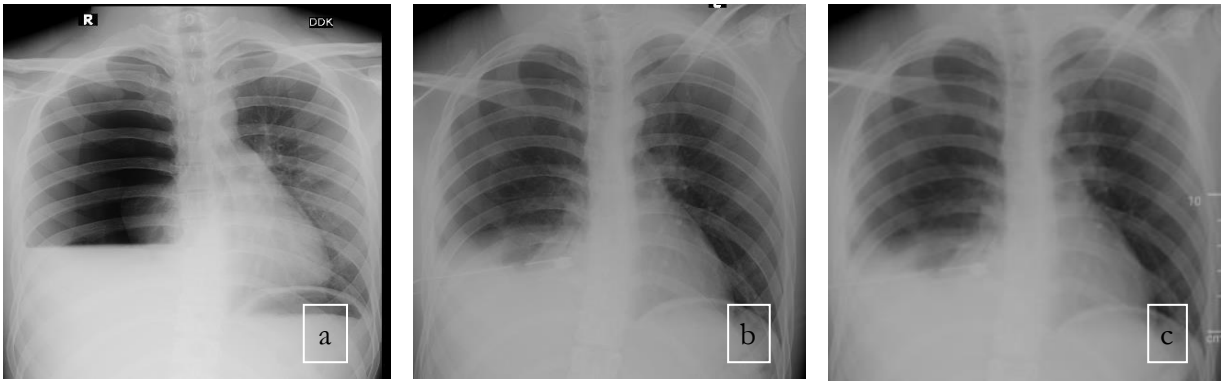


**Figure 4. Follow-up Chest X-ray;** a) when entered the emergency room, b) after WSD installation; and c) after six days of treatment

e-ISSN 2774-2318
p-ISSN 2407-0505

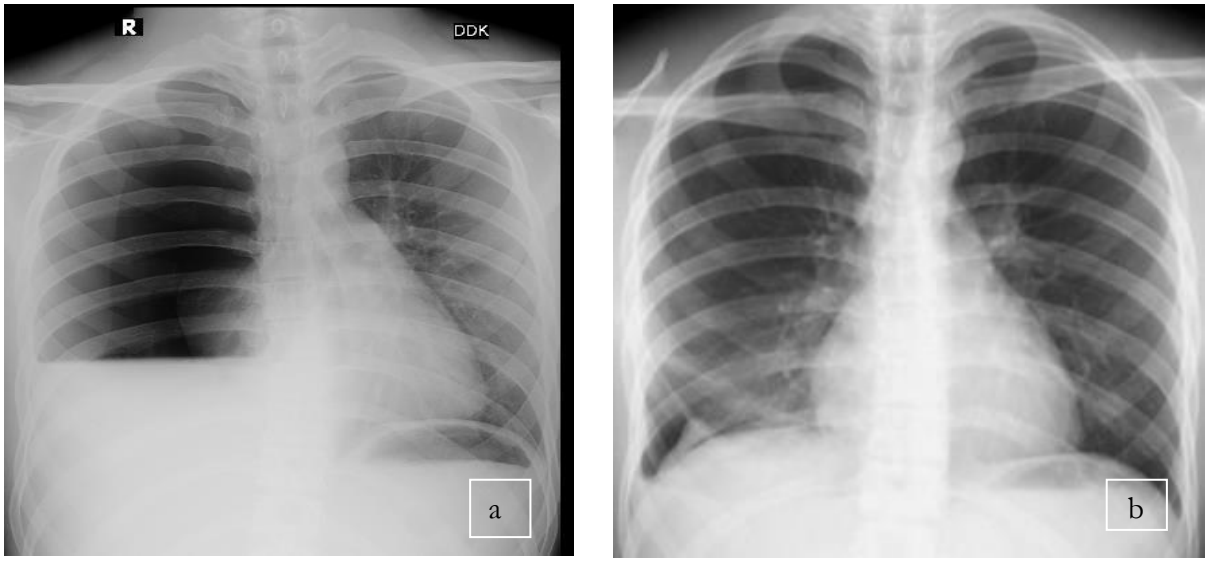


Figure 5. Follow-up Chest X-ray; a) Entered the emergency room, and b) after WSD revocation

Following up on the ninth day of treatment, the patient's general condition was good, and the vital signs were within normal limits. The WSD found that the amount of fluid was minimal. A chest X-ray was done, but there was still a little hydropneumothorax at the base of the right lung. The piston tube was removed, and the patient was sent home.

## DISCUSSION

An 18-year-old male patient with a final diagnosis of hydropneumothorax dextra et cause amebiasis. *Amebiasis* is a protozoal infection caused by *Entamoeba histolytica.* [8] There are two types of amebiasis infection. They are pathogenic and apathogenic, whereas *Entamoeba histolytica* is the pathogenic form. Amebiasis can be in the intestinal and extraintestinal, including pulmonary amebiasis.[9] Amebiasis, in this case, was established from parasitology results, namely *entamoeba histolytica* was found in the pleural fluid.[10]

Epidemiologically, gender followed the theory, namely male, but this report found a younger age in this case. Amebiasis infection was ten times more common in men than women and often occurred at 30-40 years old.[11]Amebiasis infection is common in tropical and developing countries, where sanitation, hygiene, and low socio-economic status are major problems.[10] The cause of the younger age in these patients is related to poor sanitation and hygiene, so they were at risk of being suffered by a younger age. The highest risk of amebiasis is found in people with low socio-economic status, poor sanitation, people who do not care about cleanliness, dense population, and lack of clean water availability.[12] Flies and cockroaches that land on human feces containing cysts can transfer these cysts to food or drink. Cysts can live long in water (10-14 days).[13] In a cool and humid environment, cysts can live for 12 days. Cysts are resistant to chlorine and die at 50°C or in dry conditions.[14] Other risk factors are malnutrition, alcoholism, and arterial septal defects in developed countries, mainly


doi: 10.26714/magnamed.10.2.2023.229-238
10 (2) August 2023

e-ISSN 2774-2318
p-ISSN 2407-0505

found in homosexuals, travelers from endemic countries, immigrants, prisoners, and hostels. There was no difference in prevalence between tropical and subtropical regions.[11,15,16]

Pneumothorax could occur at a young age caused by tuberculosis (TB). However, Mycobacterium tuberculosis was not found in this patient in the sputum examination, so we could exclude this diagnosis.[17] Diagnosis of pulmonary amebiasis is challenging because there is no typical clinical picture. In endemic countries, possible pulmonary lesions of amoeba can be considered.[1] The imaging description depends on the disease stage, abscess location, hepatic involvement, and the thorax. The radiological early is a blurred border of the hemidiaphragm or unclear on the right side.[14] This stage of the patient complaining of chest pain. Along with the development of complaints and disease image will change.[2]

The most common symptom is fever (82-100% of patients), lasting for several weeks, with right abdominal pain above and an enlarged liver.[15] Hemoptysis (44-50% of patients) may occur accompanied by phlegm of "anchovy sauce-like" pus, indicating pus is coming from the liver—hemoptysis due to pulmonary infarction caused by pulmonary thromboembolism from amebiasis liver abscess. Hiccups are an indication of diaphragmatic involvement. Usually, the patient begins with diarrhea with loose stools, slimy and bloody, with frequency reaching 10x per day, and abdominal pain in the upper right quadrant is found in 1/3 of patients.[18] The most common symptoms include pain, cough, hemoptysis, and dyspnea. Pain may be pleuritic or localized in the upper right quadrant. Cough can be non-productive but is more often associated with expectoration from sputum in quantities small to amoeba in large numbers.[2] The physical examination reveals enlarged liver and palpable soft percussion deafness and loss or decreased voice breath. Crepitation can be found in 22% of patients. Cough with phlegm was found in 87- In 100% of patients. Hypochondriac pain was found in 19-88%, and breathlessness was found in 23% of patients.[11] This patient was found with breathlessness, cough, fever, and chest pain, and characteristic symptoms such as disturbances were found gastrointestinal tract (abdominal pain, nausea, vomiting, diarrhea, and discomfort in the stomach) two last weeks. No physical examination of liver enlargement was found.

Chest X-Ray signs in pulmonary amebiasis, among others: (1) right diaphragm elevation; (2) triangular area of consolidation with base opposite the diaphragm and apex pointing toward the hilum; (3) foggy appearance on the right diaphragm, brighter than the liver shadow, more easily seen in the posterior-anterior position; (4) pleural effusion was present in 62.5% of cases; (5) air-filled cavities with or without an air-fluid level; (6) abscess found in 2.5% of cases due to hematogenous spread; (7) bronchography shows non-filling of the middle lobe or the basal segments of the lower lobe; (8) diaphragmatic fluoroscopy shows a decrease or loss of diaphragmatic motility.[6] The patient's chest radiograph shows a picture of hydropneumothorax, no diaphragm elevation, cavities, or abscess.[19]

Amebiasis pleural fluid has distinctive characteristics, including thick, whitish, and anchovy paste. The color can vary from pink to red-

e-ISSN 2774-2318
p-ISSN 2407-0505

dish and pale yellow to dark brown but can be mistaken for blood at first sight. Sputum mixed with pus can be colored "anchovy sauce-like" if there is a hepato-bronchial fistula and dark yellow if there is a broncho-biliary fistula.[16] Diagnosis of amebiasis should not only be based on the characteristics of pus because atypical pus is often found. The detection rate of active trophozoites under a microscope range from 0-100%. A misdiagnosis could have occurred because *Entamoeba histolytica* from sputum or pus is morphologically similar to *Entamoeba gingivalis*. Pus culture with Robinson's medium can grow *entamoeba histolytica*. Trophozoites are rarely found when examining sputum, pus, pleural fluid, and abscess aspiration.[14] The color of the pleural fluid in patients appears dark red so that the diagnosis of hemothorax cannot be ruled out. Further examination can be done on the pleural fluid, but at that time, pleural fluid hematocrit examination could not be done.

Pulmonary amebiasis is often suspected of pulmonary tuberculosis, lung abscess, and lung cancer. Coughing up blood spots can occur for several weeks, and an appearance of opacity in the right lung, clubbing fingers, and weight loss can be suspected of lung cancer. Repeated coughing up of blood is often suspected of pulmonary tuberculosis. Other differential diagnoses include primary and secondary lymphoma, sarcoidosis, and pulmonary hydatidosis.[20] Malaria and schistosomiasis endemic areas with persistent fever can be considered another diagnosis.[14] Besides pulmonary amebiasis, it is also considered for pulmonary tuberculosis and hemopneumothorax. Pulmonary tuberculosis was thought to be because the patient was young (according to the epidemiology of pneumothorax). The GeneXpert sputum results in the patient did not find any mycobacterium tuberculosis.

Hemopneumothorax was considered because the color of the pleural fluid was red, and anemia was found in the patient, so surgery was carried out for further management. The VATS procedure revealed no blebs, adhesion, cohesion, or blood vessel tears. The choice of WSD installation was carried out for this patient. Lung cancer was not thought of in this patient because of his young age, and radiology did not support malignancy.[11]

Treatment is generally given orally and parenterally until surgery. Treatment of the intestinal lumen: Paramomycin (Humatin) antibiotics aminoglycosides not absorbed by the intestinal lumen are used to eliminate cysts in the intestinal lumen; administration should be careful in renal disorders. Dose of 25-35 mg/Kg body weight/day divided over 8 hours. Diloxanide furoate (furamit, entamizol) is the drug of choice for *Entamoeba histolytica* in the lumen. Side effects are bloating nausea, and vomiting. Dose 2x500mg per day for ten days. Drugs that act on tissues: Emetine hydrochloride is an efficacious drug at the trophozoite stage, effective administration if given parenterally because, in oral administration, the absorption is inadequate, and can be given intramuscularly or subcutaneously for ten days—intravenous administration of high toxicity to the heart. The maximum adult dose is 65 mg per day. Oral and parenteral metronidazole at a dose of 3x750 mg/day for 7-10 days. Another drug is tinidazole 1x2 g/day for five days for the treatment of choice in pulmonary amebiasis. Metronidazole works to reduce toxic components that bind to DNA and block DNA replication. Patients in critical

e-ISSN 2774-2318
p-ISSN 2407-0505

condition and with severe complications can be given emetine and dehydroemetine. Effective at the trophozoite stage in both the intestinal wall and tissues. *Entamoeba histolytica* parasite infection dies 50% with this drug. Combining it with diloxanide furoate, plus paromomycin or tetracycline, is recommended. Until now, there has been no report of resistance of *Entamoeba histolytica* to metronidazole. Use should be avoided in pregnant women in the first trimester. *Chloroquine* is a tissue amebicide effective in liver amebiasis with low side effects and toxicity. The adult dose is 1 gram for two days, then 500 mg for 2 to 3 weeks.[11,15] Patients are given metronidazole 3x500 mg as the treatment for pleural Amebiasis. The absence of specific guidelines for the duration of metronidazole therapy in cases of pleural amebiasis is a limitation of this study.

## CONCLUSION

Pleural amoebiasis occurs in patients with poor hygiene, especially in water sanitation or contact with soil. The differential diagnosis of pleural amoebiasis is Hemopneumothorax. The way to confirm the diagnosis is to find the Entamoeba histolytica parasites in the pleural fluid.

## REFERENCES

1. Akhtar T, Khan AG, Ahmed I, Nazli R, Haider J. Prevalence of amoebiasis in a model research community and its confirmation using stool antigen elisa for Entamoeba histolytica. Pak J Pharm Sci. 2016;29(5):1587–90.
2. Martínez-Girón R, Esteban JG, Ribas A, Doganci L. Protozoa in respiratory pathology: A review. Eur Respir J. 2008;32(5):1354–70.
3. Neghina R, Neghina AA, Merkler C, Marincu I, Iacobiciu I. A case report of pulmonary amoebiasis with Entamoeba histolytica diagnosed in western Romania. J Infect Dev Ctries. 2008;2(5):400–2.
4. Shenoy VP, Vishwanath S, Indira B, Rodrigues G. Hepato-pulmonary amebiasis: A case report. Brazilian J Infect Dis. 2010;14(4):372–3.
5. Shamsuzzaman SM, Hashiguchi Y. Thoracic amebiasis. Clin Chest Med. 2002;23(2):479–92.
6. Zakaria A, Al-Share B, Al Asad K. Primary Pulmonary Amebiasis Complicated with Multicystic Empyema. Case Rep Pulmonol. 2016;1–4.
7. Nas FS, Ali M. Epidemiology , Transmission and Management of Pleuropulmonary Amoebiasis : A Review. Sryahwa Publ. 2019;2(2):14–9.
8. Kantor M, Abrantes A, Estevez A, Schiller A, Torrent J, Gascon J, et al. Entamoeba Histolytica: Updates in Clinical Manifestation, Pathogenesis, and Vaccine Development. Can J Gastroenterol Hepatol. 2018;3–11.
9. Ximénez C, Morán P, Rojas L, Valadez A, Gómez A. Reassessment of the epidemiology of amebiasis: State of the art. Infect Genet Evol. 2009;9(6):1023–32.
10. Nugroho AG. A Rare Case of Primary Pulmonary Amoebiasis without Gastrointestinal Involvement : A Case Report. J Resprasi. 2021;07(200):134–8.
11. Kusters JG, Van Vliet AHM, Kuipers EJ. Pathogenesis of Helicobacter pylori infection. Clin Microbiol Rev. 2016;19(3):449–90.
12. Pham Duc P, Nguyen-Viet H, Hattendorf J, Zinsstag J, Dac Cam P, Odermatt P. Risk

e-ISSN 2774-2318
p-ISSN 2407-0505

factors for Entamoeba histolytica infection in an agricultural community in Hanam province, Vietnam. Parasites and Vectors. 2019;4(1):1–9.

13. Roro GB, Eriso F, Al-Hazimi AM, Kuddus M, Singh SC, Upadhye V, et al. Prevalence and associated risk factors of Entamoeba histolytica infection among school children from three primary schools in Arsi Town, West Zone, Ethiopia. J Parasit Dis. 2022;1–19.
14. Gaude G, Chatterji R, Bagga A. Thoracic Amebiasis. Clin Chest Med. 2012;23:479–92.
15. Martínez S, Restrepo CS, Carrillo JA, Betancourt SL, Franquet T, Varón C, et al. Thoracic manifestations of tropical parasitic infections: A pictorial review. Radiographics. 2005;25(1):135–55.
16. Inge S, Ismid S., K.P S, Saleha S. Buku Ajar Parasitologi FKUI Edisi 4. Badan penerbit FKUI. 2013;107–18.
17. Perhimpunan Dokter Paru Indonesia. Tuberkulosis : Pedoman Diagnosis dan Penatalaksanaan di Indonesia. 2021. 1–88 p.
18. Kantor M, Abrantes A, Estevez A, Schiller A, Torrent J, Gascon J, et al. Entamoeba Histolytica: Updates in Clinical Manifestation, Pathogenesis, and Vaccine Development. Can J Gastroenterol Hepatol. 2018;6–11.
19. Al-Shaibani SW. Infection with Entamoeba histolytica and its effect on some blood parameters in Najaf City. J Phys Conf Ser. 2020;1660(1):2–11.
20. Dewi K, Suci Y, Dewi I, Iswanto I. Pulmonary amebiasis complicated with massive left empyema and respiratory failure: A case report. Sanamed. 2020;15(1):45–9.