

## CASE REPORT

# Assessment of Rare Case on Patient with Filariasis-Associated Bilateral Pleural Effusion

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### ABSTRACT

Bilateral pleural effusion is fluid accumulation in both lungs of pleural spaces. The clinical manifestations of bilateral pleural effusion (chylothorax) caused by filariasis are so rare that they are often challenging to diagnose. This case study described a 21-year-old woman, domiciled in Sumatra, with complaints of shortness of breath and swollen legs. Radiological examination results found bilateral pleural effusion. Initially, it was suspected that the effusion was caused by tuberculosis, Systemic Lupus Erythematosus (SLE), and malignancy; however, treatments for these did not improve the patient's condition. A Water Seal Drainage (WSD) was inserted and a chylous or chylothorax pleural effusion was obtained, and microfilaria was founded in the nocturnal blood examinations. Oxygen and nursing interventions were administered using lung expansion and postural drainage techniques, supported by education on effective coughing and deep breathing, along with the fulfillment of nutritional needs and dietary adjustments *Malaysian Journal of Medicine and Health Sciences* (2023) 19(6):364-367. doi:10.47836/mjmhs.19.6.48

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### INTRODUCTION

The majority of pleural effusions are caused by tuberculosis, followed by malignancies. Nevertheless, there are other causes of pleural effusion, one of which is filariasis. Filariasis is often difficult to diagnose, especially in non-endemic areas. A retrospective search of the PubMed database revealed that only 19 cases were reported between 2000 to 2021 (1). Filariasis is a vector-borne tropical disease that attacks the lymph nodes. This disease is transmitted via mosquitos carrying nematode parasites, including *Brugia malayi*, *Brugia timori*, and *Wuchereria bancrofti*. This parasite is endemic in many parts of Southeast Asia including Sumatera, Indonesia (2). In the adult stage, filarial worms live in the vessels of the lymphatic system, while microfilaria, the larval form, circulates in the peripheral blood (3). Manifestations of filariasis include fever, asymptomatic microfilariae, lymphatic obstruction, and tropical pulmonary eosinophilia. In the acute phase, patients may present with fever, adenolymphangitis, funiculitis, epididymitis, or orchitis. However, in chronic filariasis, lymphedema, hydrocele, elephantiasis, and chyluria will appear. In rare cases, microfilariae can also be found in different types of body fluid, such as pleural fluid (3).

Microfilariae have been identified in the cytological examination of specimens from lymph nodes and any fluid of the body. However, fluid originating from pleural effusion is rare (1). This case study aimed to describe bilateral pleural effusions caused by filariasis and the challenges faced during diagnosis.

### CASE REPORT

A 21-year-old woman, domiciled in Medan, North Sumatra, Indonesia, was admitted to Dr. Hasan Sadikin General Hospital Bandung, Indonesia, on September 19, 2022, with complaints of shortness of breath that had lasted for a year. This shortness of breath had been getting worse two months before the patient was admitted to the hospital. It subsided when the patient sat while bending forward. She received treatment in a private hospital eight months ago for three weeks and she was told that there was fluid in the lungs. They drained a total of ± 8000 cc of pleural fluid but the patient's condition did not improve so they decided to refer her to our hospital.

The patient stated that she had no history of heart disease, diabetes, high blood pressure, or smoking and that she was diagnosed with tuberculosis eight months ago and consumed Fix Dose Combination (FDC) regularly for three months and was declared to have been cured from tuberculosis, thus stopped taking the FDC treatment.

Measurement of vital signs presented a blood pressure of 100/70 mmHg, pulse of 92 times/minute, respiration rate of 24 times/minute, axillary temperature of 36°C, 98% oxygen saturation with 3 lpm nasal cannula, and compos mentis consciousness level. The anthropometric examination presented a BMI of 16.6 kg/m<sup>2</sup> which was classified as experiencing malnutrition.

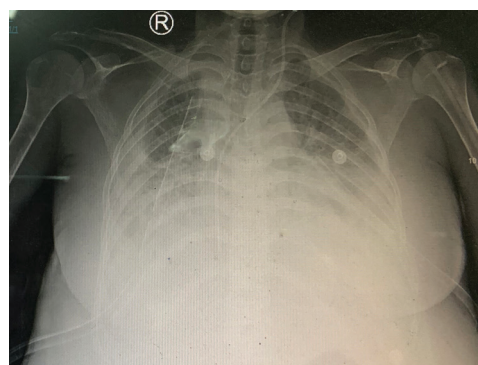
The physical examination revealed decreased vocal fremitus of the lung on palpation, bilateral dullness in two-thirds of the lungs on percussion, and bilateral vesicular sound diminution in two-thirds of the lungs on auscultation. Edema was found in both legs which prevented the patient from lifting both legs. Laboratory diagnostics demonstrated Hemoglobin 10.2 mg/dL (normal 12.3-15.3 mg/dL), leukocytosis 18,900 uL (normal  $\leq 10^3$ uL), Chest X-ray examination showed bilateral pleural effusion and bilateral pneumonia (Figure 1).



**Figure 1: Baseline chest X-ray examination showed bilateral pleural effusion**

Electrocardiograph was then performed due to suspected pericardial effusion or congestive heart failure and a low voltage was observed. However, the echocardiography showed that all parameters were within normal limits with an Ejection Fraction (EF) of 60%. The patient was suspected of suffering from pleural effusion associated with Systemic Lupus erythematosus; however, no improvement in pleural effusion was seen when steroid therapy was given. The patient also underwent gynecological examinations due to suspected malignancies with a differential diagnosis of lymphatic stasis and Deep Vein Thrombosis (DVT). No abnormality was found during the gynecological examination. The results of the duplex vascular ultrasound examination of the lower extremities also did not reveal any DVT.

She underwent a thoracotomy on September 29, 2022 (Figure 2), and milky pleural fluid with fibrin was observed (Figure 3). Hence, the patient was referred to the tropical medicine department and she was suspected to be suffering from filariasis because of the bilateral leg edema. A microfilariasis examination was pursued by collecting blood specimens at night and the



**Figure 2: Chest X-ray shows the patient has water seal drainage in the both of lungs**



**Figure 3: Milky pleural fluid with fibrin was observed from water seal drainage**

analysis showed a positive result for filariasis *Brugia malayi* (Figure 4). Finally, the diagnosis was confirmed as filariasis, chylothorax, and elephantiasis. The patient received 1x400 mg albendazole tablet and 3x100 mg diethylcarbamazine tablet therapy for 14 days.

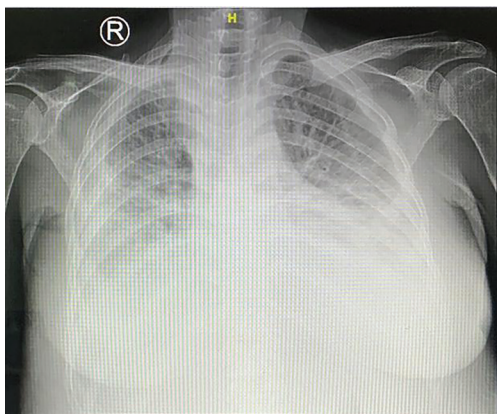
Nursing care was given to this patient according to the health problems experienced by the patient: ineffective breathing patterns caused by decreased lung expansion as a result of fluid accumulation in the pleural cavity; need for meeting the nutritional requirements to increase body metabolism; and decreased appetite due to shortness of breath as a result of compression of the



**Figure 4: The blood film showed a positive result for filariasis *Brugia malayi***

abdominal structures by pleural fluid.

Nursing interventions provided involved teaching the patient about lung expansion, postural drainage, and effective coughing techniques, along with dietary adjustments. The patient was discharged on November 13, 2022, with a chest X-ray examination showing reduced pleural effusion (Figure 5) and negative microfilaria examination results. After discharge, the patient's condition improved and the patient returned to her hometown.



**Figure 5: A repeated chest X-ray shows reduced pleural effusion treatment**

## DISCUSSION

The patient was admitted to the hospital with the main complaint of shortness of breath and the results of the chest X-ray showed a bilateral pleural effusion. Most pleural effusions are caused by tuberculosis. Shortness of breath is the most common symptom of pleural effusion (1).

The presented case was initially diagnosed as tuberculosis and treated with FDC but *M. tuberculosis* was negative. Malignancy was also suspected, but the tumor markers and gynecological examination were within normal limits. A suspicion of a pericardial effusion arose due to the low-voltage ECG result but the echocardiography results demonstrated that all parameters were within normal limits. Since the pleural effusion increased, a thoracotomy was performed and a chylothorax pleural effusion was found.

Chylous pleural effusion (chylothorax), may be triggered by an obstruction or injury to the thoracic duct or its branches, leading to a direct or indirect flow of chylous fluid from the abdominal cavity across the diaphragm into the thoracic cavity. The common causes include trauma and malignant tumors that directly erode, damage, destroy, or compress the thoracic duct, while rare causes are primary lymphatic disease and infection (4).

Our client had no history of trauma or malignancy. The examination of the lower extremities presented edema in

both legs, leading to a suspicion of filariasis, especially because the patient came from a filariasis-endemic area. Pleural effusion is a rare manifestation of filariasis that may mimic tuberculosis or other causes of effusion. The majority of clients are young to middle age (median) with a mean age of 36 years old, males, and have higher exposure to disease vectors (1).

The patient in this case study was a 21-year-old woman from Medan, North Sumatra, which is one of the filariasis endemic areas in Indonesia. When the patient was presented for the first time to the hospital, it was very challenging to identify the cause of bilateral pleural effusions. Eventually, the filariasis-associated bilateral chylous pleural effusions diagnosis was confirmed after blood tests demonstrated the presence of microfilaria. Similar cases were found by Aggarwal et al, and Shukla et al. in India (filariasis endemic area) who initially had difficulty diagnosing pleural effusion caused by filariasis because pleural effusions are often caused by tuberculosis and other causes of effusion such as malignancy. After tuberculosis and malignancy were excluded, a cytological examination of the pleural fluid was performed and microfilaria *W. bancrofti*. was found. Furthermore, the patient was given diethylcarbamazine 300 mg orally a day in divided doses and the patient's condition responded well to treatment (1,3)

Filarial pleural effusions are mostly exudative in nature and occur due to lymphatic inflammation and incomplete blockage of the lymphatics. Filariasis usually produces a chylous effusion due to the leakage of the chyle caused by thoracic duct obstruction (1,3). Microfilariae in pleural fluid suggest partial obstructive lymphangitis and lymphatics, leading to extravasation of microfilariae into the pleural cavity to be the main mechanism (1).

Water seal drainage (WSD) is recommended to manage massive pleural effusions, Thus, facilitating the rapid drainage of drained pleural fluid is an important goal in the management of these patients (5). Lung expansion techniques can be used to accelerate the drainage of pleural fluid drainage and, thereby, reducing the likelihood of complications from WSD. Thoracotomy and WSD were then performed to relieve the bilateral massive pleural effusion and chylous pleural fluid was found.

The postural drainage technique is a technique that applies proper posture according to bronchial anatomy by utilizing the force of gravity in facilitating the expulsion of sputum from the periphery of the lung to the central airway or artificial drainage channel. Nursing interventions for this patient include providing comfort by positioning the patient in a 60-90o sitting position on an elevated bed or by tilting the patient to the affected side. The sitting position applied to patients with pleural effusion is known as the lung expansion technique. This

technique aims to lower the diaphragm and expand the chest so that the lungs can expand optimally. The technique of tilting the patient to the affected side is known as the postural drainage technique. This position can prevent the effect of fluid suppression due to gravity and accelerate the expulsion of pleural fluid through the WSD and, ultimately, expand the lungs (5).

## CONCLUSION

Filariasis-associated bilateral massive pleural effusion is a rare disease that can be challenging to diagnose. The presence of exudative pleural effusion (chylothorax) and adult worms that cause filariasis, or microfilariasis, confirms the diagnosis of this condition. In bilateral massive pleural effusions, thoracentesis or WSD must be performed to remove pleural fluid, in addition to the application of postural drainage techniques, to increase lung expansion which will relieve patients from the shortness of breath.

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