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# Recurrent Malignant Pleural Effusion With Lymphangitic Carcinomatosis Due To Pulmonary Epithelial Adenocarcinoma With Lepidic Spread - A Case Report With Review Of Literature

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**Abstract**

Recurrent right-sided pleural effusion is a common yet diagnostically challenging clinical entity, with etiologies ranging from myriad causes , namely benign ones such as infections, hepatic disease and malignancy to systemic and rare inflammatory conditions. While most pleural effusions resolve with treatment of the underlying cause, recurrence despite appropriate therapy necessitates thorough evaluation to identify uncommon or overlooked diagnoses. Unilateral recurrent effusions, in particular, raise suspicion of malignancy, tuberculosis, or chronic pleural pathology and often require repeated fluid analysis, imaging, and sometimes invasive procedures for definitive diagnosis. We report a case of recurrent right-sided pleural effusion to highlight the diagnostic approach and clinical considerations in managing such patients.

**Keywords**: NIL

## Introduction

A 56-year-old female presented with complaints of progressive breathlessness for one month (MMRC grade III), dry cough for two months, and loss of weight and appetite for the past two months. She also reported generalized weakness for one month. There was no history of fever, chest pain, or hemoptysis.

The patient was admitted for further evaluation in view of her symptoms Routine blood investigations were performed along with chest radiography and ultrasonography of the thorax, both of which revealed a gross right-sided pleural effusion. Ultrasonography of the chest showed a moderate amount of pleural fluid in the right pleural cavity with associated atelectasis and underlying parenchymal consolidation.

Ultrasound-guided diagnostic and therapeutic thoracocentesis was performed, and approximately 1600 mL of hemorrhagic pleural fluid was aspirated. Pleural fluid samples were sent for routine analysis, adenosine deaminase (ADA), lactate dehydrogenase (LDH), cytology, culture, and Cartridge-based nucleic acid amplification test (CB-NAAT) for Mycobacterium tuberculosis.

The Pleural fluid after analysis was found to be a lymphocytic -predominant (90%) exudate with elevated protein level of 4.2 g/dL. Pleural fluid ADA was low (4.9 U/L), and CB_NAAT and culture were negative for TB. Pleural fluid Cytology was suspicious for epithelial malignancy. High- resolution computed tomography (HRCT) of the thorax demonstrated moderate right-sided pleural effusion with passive atelectasis and nodular intralobular septal thickening involving the right upper, middle, and lower lobes, findings suggestive of lymphangitic carcinomatosis

with multiple non necrotic to partially necrotic pre-tracheal, para-tracheal and bilateral hilar lymph nodes.

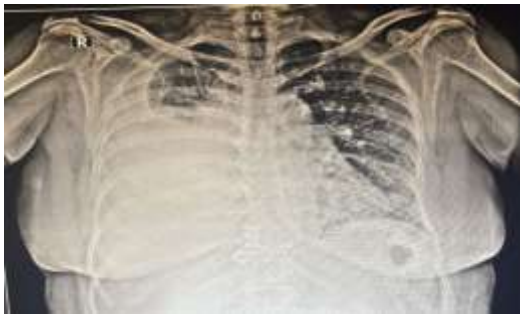
Fibreoptic Bronchoscopy with Bronchoalveolar lavage (BAL) and Transbronchial lung biopsy(TBLB) was performed with biopsy was taken from the right middle lobe and was sent for Histopathology with BAL samples for routine, cytology, CB-NAAT, AFB, KOH. The

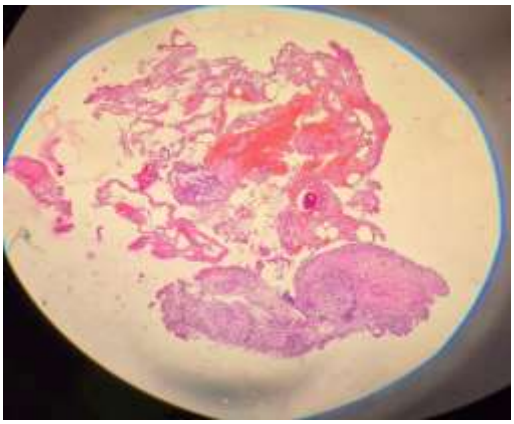
BAL cytology was suggestive of epithelial malignancy.

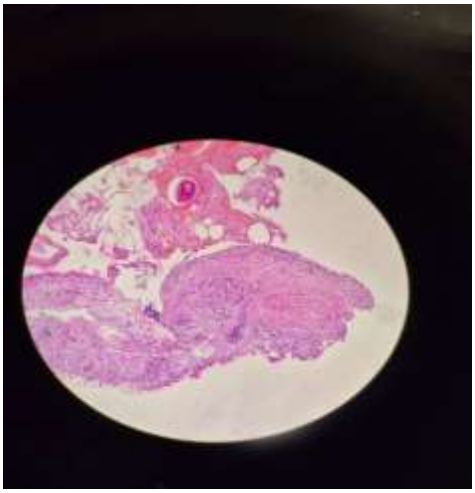
Tissue HPE was suggestive of focal areas with presence of atypical malignant cells individual tumour cells are large having moderately pleomorphic vesicular to hyperchromatic nuclei with raised nucleus to cytoplasmic ratio with few areas of hemorrhage is noted features suggestive of epithelial malignancy favors adenocarcinoma.

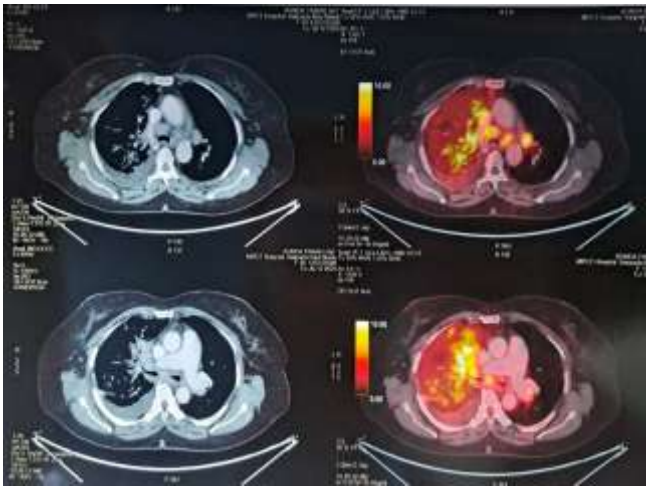
PET CT was suggestive of increased metabolic activity noted in mass like consolidation SUV max

10.3 in right hilar region with increased interstitial septal thickening noted in both lungs with tiny nodularity SUV max 5.7. increased metabolic activity noted in bilateral level IV and V cervical, supraclavicular, mediastinal, right axillary and deep pectoral lymph nodes. Mild right sided pleural effusion noted.









**Discussion:**

Recurrent unilateral pleural effusion is a common yet clinically significant presentation that often indicates an underlying chronic or malignant process. When pleural effusion recurs despite adequate drainage and initial evaluation, malignancy becomes a primary consideration, particularly in older patients with systemic symptoms such as weight loss, anorexia, and progressive dyspnea.

Pleural effusions associated with malignancy are typically exudative and may be hemorrhagic, as seen in the present case. Although lymphocyte-predominant effusions are commonly associated with tuberculosis, a low pleural fluid adenosine deaminase (ADA) level and negative GeneXpert effectively reduce the likelihood of tuberculous pleuritis. In such scenarios, radiological evaluation plays a crucial role in identifying alternative etiologies.

High-resolution computed tomography (HRCT) of the thorax is instrumental in characterizing underlying



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lung pathology in recurrent pleural effusions. In our case, HRCT revealed nodular intralobular septal thickening with associated pleural effusion and passive atelectasis, suggestive of malignant infiltration. These imaging findings are characteristic of lymphangitic spread, which occurs due to tumor dissemination through pulmonary lymphatics. Lepidic spread, commonly associated with adenocarcinoma of the lung, involves neoplastic growth along the alveolar septa while preserving the underlying lung architecture. This pattern may coexist with lymphangitic carcinomatosis and is frequently associated with persistent or recurrent pleural effusion.

Malignancy-related pleural effusion may occur due to direct pleural involvement, lymphatic obstruction, or increased capillary permeability. Notably, pleural fluid cytology can be negative in a significant proportion of cases, particularly in early disease or when pleural involvement is minimal. Therefore, a negative cytology does not exclude malignancy, and repeated sampling, image-guided pleural biopsy, or thoracoscopic evaluation may be required for definitive diagnosis.

Lepidic-predominant adenocarcinoma often presents with non-specific respiratory symptoms and radiological findings that may mimic infection or interstitial lung disease, leading to diagnostic delay. Recognition of this growth pattern is essential, as it has therapeutic and prognostic implications. The presence of lymphangitic spread generally signifies advanced disease and is associated with poorer outcomes.

This case highlights the importance of a systematic approach to recurrent unilateral pleural effusion, integrating clinical features, pleural fluid analysis, and advanced imaging. In patients with low ADA, hemorrhagic exudative effusion, and HRCT findings suggestive of lepidic or lymphangitic spread, malignancy should be strongly suspected, and prompt tissue diagnosis should be pursued to guide further management.

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