

## Case Report

# Shadows of Doubt: When Lung Adenocarcinoma Mimics Interstitial Lung Disease

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## Abstract

Lung adenocarcinoma commonly presents as a peripheral pulmonary mass; however, atypical presentations mimicking interstitial lung disease (ILD) are rare and diagnostically challenging. We report a case of a 67-year-old female presenting with subacute respiratory symptoms and diffuse interstitial changes on imaging, initially suggestive of ILD. Bronchoscopic evaluation was inconclusive, but transbronchial lung biopsy confirmed adenocarcinoma. This case highlights the importance of considering malignancy in atypical ILD presentations and underscores the role of early tissue diagnosis in selected cases.

**Keywords:** Adenocarcinoma lung, Interstitial lung disease, Transbronchial lung biopsy.

## INTRODUCTION

Interstitial lung disease (ILD) represents a broad spectrum of diffuse parenchymal lung disorders characterized by inflammation and fibrosis of the lung interstitium. Clinically, patients present with progressive dyspnea, dry cough, and hypoxemia, often accompanied by diffuse infiltrates on imaging.<sup>1</sup> Lung adenocarcinoma is the most common subtype of non-small cell lung cancer and typically manifests as a solitary peripheral lesion. However, certain histological variants, particularly lepidic-predominant adenocarcinoma and invasive mucinous adenocarcinoma, may demonstrate diffuse parenchymal involvement and mimic ILD both radiologically and clinically.<sup>2,3</sup> Such atypical presentations often lead to misdiagnosis as ILD, pneumonia, or organizing pneumonia, resulting in delayed diagnosis and inappropriate treatment.<sup>4</sup>

Recent literature highlights that lung adenocarcinoma presenting as ILD-like disease is an under-recognized entity, where initial investigations, including bronchoalveolar lavage, may be non-diagnostic, necessitating histopathological

confirmation.<sup>5,6</sup> Awareness of this overlap is crucial for timely diagnosis and management.

## Case Report

A 67-year-old female was admitted in cardiology department with Low-grade intermittent fever for 20 days, Left-sided dull, non-radiating chest pain for 15 days, progressive breathlessness, dry cough, and weakness for the last 10 days. She was initially managed as a case of ischemic heart disease and later referred for respiratory evaluation due to an abnormal chest radiograph.

The patient had a past history of myocardial infarction seven years back and recovered well. She also had other illness like type 2 diabetes mellitus for the last 25 years, for which she was taking oral hypoglycemic agents regularly, resulting in controlled blood sugar levels. She had long-standing uterine cervical prolapse and was managed conservatively. There was no history suggestive of tuberculosis, asthma, or hypertension, etc., in the past. She also had reported mild dysphagia to solids and loss of appetite for the last three weeks, which was significant. She denied a history of smoking or any other addiction.

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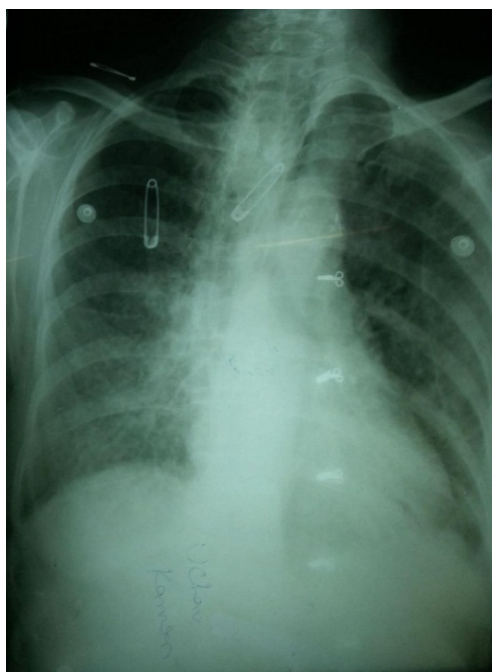
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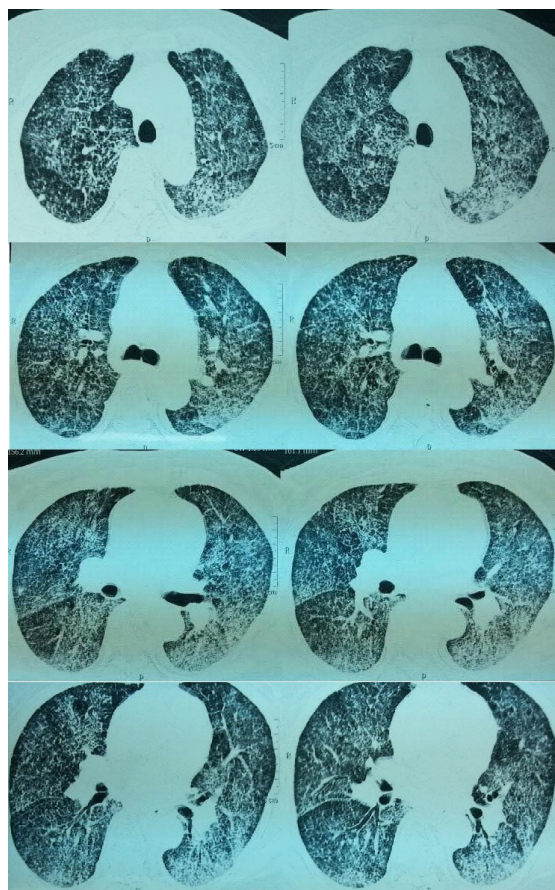
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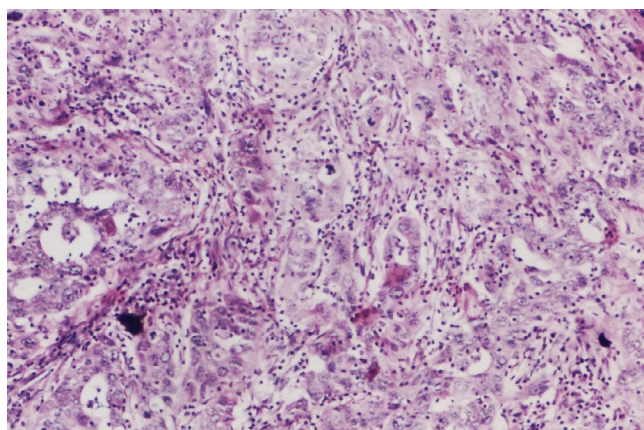
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**Figure 1:** Chest X-ray PA view showing diffuse bilateral reticulonodular opacities predominantly involving lower zones.



**Figure 2:** HRCT chest showing bilateral diffuse nodular lesions from apex to base with interlobular, interseptal thickening and nodules lying along the septa.



**Figure 3:** Photomicrograph of transbronchial lung biopsy showing adenocarcinoma lung. (HE x 400)

On clinical examination, the oxygen saturation (SpO<sub>2</sub>) was 70% on room air. On general physical examination, pallor, cyanosis, & pedal edema were present. On examination of the respiratory system, the trachea was central, and there were no other chest abnormalities on inspection and palpation. On auscultation, bilateral vesicular breath sounds of low intensity were heard with fine late inspiratory crepitations at the lung bases and no wheeze or rhonchi were present.

Her investigations revealed hemoglobin 9 gm/dl, normal leucocyte count, and absolute eosinophilic count 150 cells/mm<sup>3</sup>. Viral markers like HBsAg, HIV, etc., were non-reactive. Ultrasonography of the whole abdomen revealed no abnormality. Pap smear of the cervix was suggestive of chronic inflammatory disease. On the chest X-ray, findings were suggestive of diffuse bilateral reticulonodular opacities predominantly involving the lower zone (Figure 1). Evaluation of her HRCT chest confirmed bilateral nodular lesions from apex to base with interseptal thickening and nodules along septa (Figure 2). On the mediastinal window, pretracheal & paraseptal lymphadenopathy was seen. These findings were consistent with sarcoidosis or lymphangiocarcinomatosis, patterns of interstitial lung disease.

The patient subsequently underwent fibreoptic bronchoscopy (FOB) and the report of bronchoalveolar lavage (BAL) cytology was suggestive of inflammatory pathology. Transbronchial needle aspiration (TBNA) of pretracheal nodes suggested mixed inflammatory cells but no atypical cells, suggesting inflammatory pathology. Transbronchial lung biopsy (TBLB) was performed, which on histopathological examination revealed malignant cells with hyperchromatic nuclei arranged in a glandular and acinar pattern suggestive of adenocarcinoma of the lung (Figure 3).

Due to financial and infrastructural constraints, advanced modalities such as positron emission computed tomography (PET-CT) and molecular profiling were not performed and the patient was referred to the oncology department.

## DISCUSSION

This case highlights an uncommon yet clinically important presentation of lung adenocarcinoma manifesting as diffuse interstitial lung disease (ILD). Although adenocarcinoma is the most frequent subtype of non-small cell lung cancer, it typically presents as a solitary peripheral lesion. However, certain histological variants, particularly lepidic-predominant and invasive mucinous adenocarcinoma, can grow along alveolar structures without forming a discrete mass, resulting in diffuse radiological patterns that closely resemble ILD. This overlap often creates diagnostic uncertainty, especially in elderly patients presenting with progressive dyspnea and bilateral infiltrates on imaging<sup>2,3</sup> as happened in our case.

Radiologically, the presence of ground-glass opacities, interlobular septal thickening, and diffuse nodular infiltrates can mimic a wide spectrum of interstitial lung diseases, including nonspecific interstitial pneumonia, organizing pneumonia, and even pulmonary fibrosis. Studies have shown that pneumonic-type adenocarcinoma may present with consolidative or diffuse infiltrative patterns, making it difficult to distinguish from inflammatory or fibrotic lung conditions based on imaging alone.<sup>5</sup> In such scenarios, reliance solely on radiological findings may lead to misclassification and delay in appropriate diagnosis. This type of periseptal nodular distribution and interlobular septal thickening with beaded appearance, as seen in our case, are otherwise classical findings seen with sarcoidosis or pulmonary lymphangiocarcinomatosis. If transbronchial lung biopsy could not have been done in our case, the actual diagnosis might have been missed.

Another key challenge demonstrated in this case was the limitation of conventional bronchoscopic diagnostic techniques. Bronchoalveolar lavage and transbronchial needle aspiration are frequently non-diagnostic in cases of diffuse or peripherally distributed tumors due to sampling error and heterogeneous tumor spread. Previous reports have similarly described false-negative initial investigations, with diagnosis only established after histopathological examination of lung biopsy specimens.<sup>7,8</sup> This underscores the importance of pursuing tissue diagnosis aggressively when clinical and radiological findings are incongruent or when patients fail to respond to empirical therapy.

This case also has important implications for clinical practice. Early consideration of malignancy in atypical ILD presentations, combined with timely use of invasive diagnostic procedures such as transbronchial or surgical lung biopsy, can significantly improve diagnostic accuracy. A multidisciplinary approach involving pulmonologists,

radiologists, and pathologists is essential for such complex cases. Recognizing these unusual presentations is crucial, as early diagnosis not only prevents inappropriate treatment but also allows for timely initiation of oncological management, which may ultimately improve patient outcomes.<sup>9,10</sup>

In conclusion, adenocarcinoma of the lung can rarely present as diffuse interstitial lung disease, posing a significant diagnostic challenge. This case emphasizes the need for a high index of suspicion and early histopathological confirmation in atypical ILD presentations to avoid delay in diagnosis.

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