

THE INVISIBLE GIANT: A GIANT PLEURAL-BASED MASS-LIKE CONSOLIDATION SUBTLE ON CHEST SCANOGRAM BUT REVEALED BY COMPUTED TOMOGRAPHY IN A PATIENT PRESENTING WITH LOWER RESPIRATORY TRACT INFECTION

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ABSTRACT

Pleural-based mass lesions are uncommon thoracic abnormalities that frequently pose a diagnostic challenge because of their nonspecific clinical presentation and variable radiological appearance. Patients often present with symptoms suggestive of lower respiratory tract infection (LRTI), resulting in delayed recognition of an underlying malignant process. Although chest radiography remains the initial imaging modality for evaluating respiratory complaints, its sensitivity is limited for detecting peripheral or pleural-based lesions located in anatomical blind spots. Computed tomography (CT) plays a pivotal role in identifying radiographically occult lesions and accurately defining their extent. We report the case of a 51-year-old woman who presented with fever and progressive shortness of breath of 15 days' duration. Based on the clinical presentation, she was initially diagnosed with suspected lower respiratory tract infection. A chest radiograph performed at presentation did not reveal any significant abnormality despite persistent respiratory symptoms. Owing to the continued clinical suspicion, a CT scan of the thorax was obtained, which demonstrated a large pleural-based mass-like consolidation measuring approximately 76 × 73 × 67 mm involving the anterior and lateral basal segments of the right lower lobe, associated with abrupt bronchial cut-off, multiple enlarged right hilar and mediastinal lymph nodes, and a 35 × 28 mm subcarinal nodal mass with internal calcifications. No pleural or pericardial effusion was identified. The radiological findings strongly suggested an underlying malignant etiology rather than an infective process. The patient was subsequently referred for histopathological evaluation to establish a definitive diagnosis.

This case highlights the limitations of conventional chest radiography in detecting large pleural-based thoracic lesions and emphasizes the indispensable role of CT in patients with persistent respiratory symptoms despite a normal chest X-ray. Early utilization of advanced cross-sectional imaging can facilitate prompt diagnosis, appropriate staging, and timely tissue sampling, thereby preventing delays in the management of potentially life-threatening thoracic malignancies. Clinicians should maintain a high index of suspicion when clinical findings and initial radiographic results are discordant, as reliance on chest radiography alone may overlook significant intrathoracic pathology.

KEYWORDS: Pleural-based mass, Computed tomography, Chest radiography, Lower respiratory tract infection, Lung malignancy, Mediastinal lymphadenopathy, Case report.

INTRODUCTION

Pleural-based mass-like lesions present a significant diagnostic challenge because they may represent a wide spectrum of benign and malignant conditions, including organizing pneumonia, primary pleural tumors, metastatic disease, or peripheral lung malignancies extending to the pleura. Clinical manifestations are often nonspecific and include cough, fever, dyspnea, and chest pain, frequently leading to an initial diagnosis of lower respiratory tract infection (LRTI). Consequently, patients are commonly evaluated with chest radiography as the first-line imaging modality. However, conventional chest radiographs have limited sensitivity for detecting lesions located in anatomical blind spots, particularly peripheral, pleural-based, retrocardiac, or lower lobe abnormalities, resulting in delayed or missed diagnoses [1,2].

Computed tomography (CT) of the thorax provides superior spatial resolution and multiplanar imaging, enabling accurate characterization of pleural-based lesions, assessment of bronchial obstruction, mediastinal lymphadenopathy, pleural involvement, and adjacent thoracic structures. CT also plays a crucial role in differentiating infective consolidation from neoplastic lesions and guides subsequent diagnostic procedures, including bronchoscopy and histopathological examination [1]. Previous studies have demonstrated that lung malignancies and pleural metastatic lesions may remain occult on chest radiography but become readily apparent on CT, emphasizing the complementary

role of advanced imaging in patients with persistent respiratory symptoms despite apparently normal or inconclusive radiographic findings [2,3].

We report a diagnostically challenging case of a 51-year-old woman presenting with fever and shortness of breath, initially managed as LRTI. While the chest radiograph was unremarkable, CT thorax revealed a giant pleural-based mass-like consolidation with bronchial cut-off and mediastinal lymphadenopathy, highlighting the indispensable role of CT in detecting radiographically occult thoracic lesions and prompting timely histopathological evaluation to exclude underlying malignancy.

Case Presentation

A 51-year-old female, Mrs. Bhuvaneswari, presented to the Department of General Medicine with complaints of shortness of breath for 15 days, which had progressively worsened over the preceding week. She also complained of fever during the same period. There was no documented history of hemoptysis, significant chest pain, or recent weight loss at presentation. Based on the clinical symptoms, an initial diagnosis of lower respiratory tract infection (LRTI) was considered, and the patient underwent routine radiological evaluation.

Imaging and Histopathology

A chest radiograph was obtained as the first-line imaging investigation. The radiograph and scanogram demonstrated only a subtle radio-opacity in the lower zone of the right lung, which was not sufficient to explain the patient's persistent respiratory symptoms or reveal the true extent of the underlying lesion. In view of the ongoing dyspnea and the subtle radiographic abnormality, further evaluation with non-contrast computed tomography (CT) of the thorax was performed. CT of the chest demonstrated a large pleural-based mass-like consolidation measuring approximately $76 \times 73 \times 67$ mm, involving the anterior and lateral basal segments of the right lower lobe, with abrupt bronchial cut-off, raising concern for an obstructive lesion. The adjacent ribs appeared normal without evidence of bony erosion. Scattered areas of mosaic attenuation were noted in both lungs involving all lobes. Multiple discrete non-calcified mediastinal and right hilar lymph nodes were identified, with the largest measuring 20×17 mm in the right upper paratracheal region. In addition, a large subcarinal nodal mass measuring approximately 35×28 mm, with tiny internal calcifications, was noted, suggestive of significant mediastinal lymphadenopathy. There was no pleural effusion or pericardial effusion, and the thoracic esophagus appeared grossly normal. Incidental early dorsal spondylotic changes were also observed.

The radiological impression favored a large pleural-based mass-like consolidation associated with abrupt bronchial cut-off and mediastinal/right hilar lymphadenopathy, with malignancy considered more likely than an infective etiology. Histopathological confirmation was therefore recommended. The associated large suspicious subcarinal nodal mass further strengthened the suspicion of an underlying malignant process.

The patient was subsequently referred for further diagnostic work-up, including histopathological examination (HPE) of the lesion. Biopsy of the lesion revealed squamous cell carcinoma of the lung, establishing the definitive diagnosis.

This case illustrates a diagnostically challenging presentation in which a large pleural-based thoracic malignancy manifested only as a subtle right lower-zone radio-opacity on the initial scout/radiographic image, while CT clearly demonstrated the true size, pleural-based morphology, bronchial cut-off, and associated mediastinal and right hilar lymphadenopathy. The case emphasizes the importance of proceeding to cross-sectional imaging when respiratory symptoms persist despite minimal or subtle abnormalities on initial chest radiography.

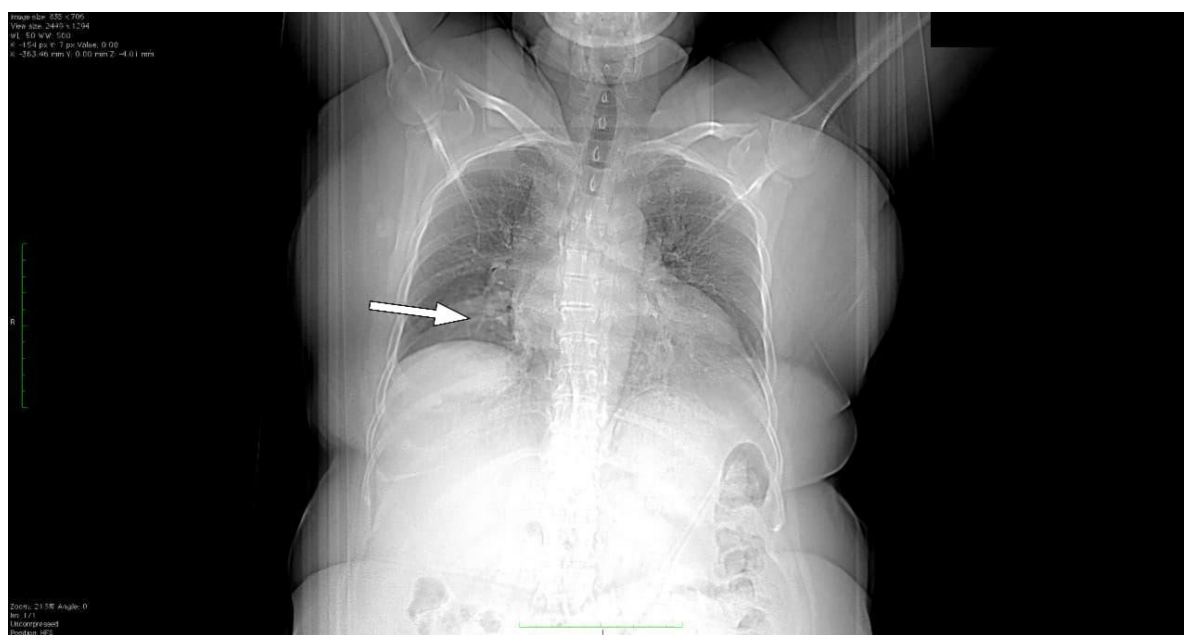


Figure 1. CT scout/scannogram demonstrating a subtle right lower-zone pleural/parenchymal radio-opacity (arrow), which was subsequently characterized as a large pleural-based mass-like consolidation on computed tomography.

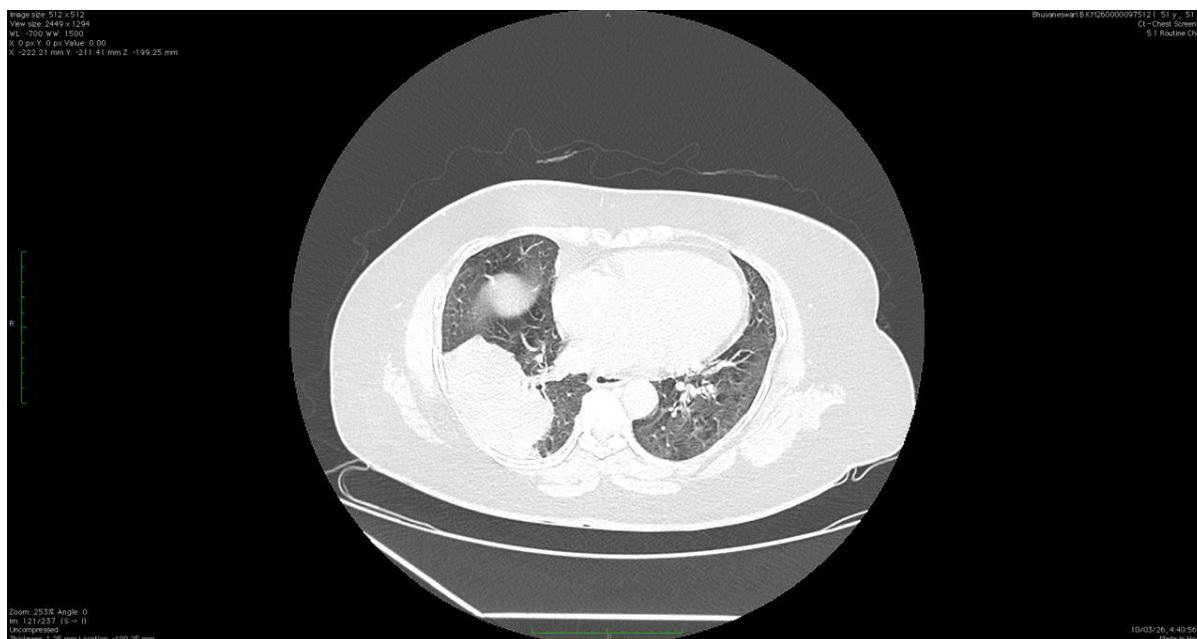


Figure 5. Axial CT image (lung window) showing the right lower pleural-based lesion with adjacent collapse/consolidative changes and pleural effusion.

DISCUSSION

Pleural-based mass-like lesions are diagnostically challenging because they encompass a broad spectrum of benign and malignant conditions, including primary pleural neoplasms, peripheral lung carcinomas with pleural extension, metastatic disease, and inflammatory lesions. Clinical manifestations are often nonspecific, with dyspnea, fever, and cough closely resembling lower respiratory tract infection (LRTI), frequently delaying the diagnosis of an underlying malignancy [1]. In the present case, the patient presented with shortness of breath and fever, leading to an initial clinical diagnosis of LRTI. However, despite persistent symptoms, the initial chest radiograph was unremarkable, highlighting the limitations of conventional radiography in detecting peripheral pleural-based lesions.

Kim et al. demonstrated that lung cancers are frequently overlooked on chest radiographs because of anatomical blind spots, particularly lesions located in the lower lobes, retrocardiac region, or adjacent to the pleura, emphasizing the complementary role of CT in patients with persistent respiratory symptoms despite a normal chest X-ray [2]. Similarly, in our patient, CT thorax revealed a large pleural-based mass-like consolidation measuring $76 \times 73 \times 67$ mm in the right lower lobe, a lesion that was not identified on the initial radiograph, underscoring the superior diagnostic sensitivity of CT.

The CT findings in our case also demonstrated right hilar and mediastinal lymphadenopathy, with the largest right paratracheal lymph node measuring 20×17 mm, along with a 35×28 mm subcarinal nodal mass containing tiny calcifications. Comparable observations were reported by Hwang et al., who described CT as an essential modality for identifying pleural metastatic disease and mediastinal lymph node involvement that may remain occult on conventional imaging, thereby facilitating appropriate staging and treatment planning [3].

Peripheral lung malignancies may closely resemble pleural tumors both clinically and radiologically. Satria et al. reported a case of lung adenocarcinoma presenting as a pleural mass, emphasizing that definitive differentiation requires histopathological examination [4]. Likewise, Lee et al. described pleural small-cell lung carcinoma masquerading as malignant mesothelioma, illustrating the considerable overlap in imaging features among thoracic malignancies [5]. In the present case, the radiological impression favored malignancy over an infective process because of the bronchial cut-off, bulky pleural-based lesion, and associated mediastinal lymphadenopathy, although histopathological confirmation remained essential.

Diffuse pulmonary malignancies may also present with atypical imaging appearances. Higgins et al. described primary pulmonary lymphoma causing extensive thoracic opacification, highlighting the diverse radiological spectrum of thoracic neoplasms and reinforcing the importance of tissue diagnosis in unusual presentations [6].

Overall, our case uniquely illustrates a giant pleural-based mass-like consolidation that remained occult on chest radiography despite significant respiratory symptoms, with CT revealing not only the primary lesion but also associated mediastinal and hilar nodal disease. The case reinforces that persistent clinical suspicion should prompt CT evaluation even when chest radiography appears normal, allowing earlier diagnosis and timely histopathological assessment of potentially life-threatening thoracic malignancies [7].

CONCLUSION

This case highlights the diagnostic limitations of conventional chest radiography in identifying large pleural-based thoracic lesions, particularly when clinical features mimic lower respiratory tract infection. Despite persistent respiratory

symptoms and an initially unremarkable chest X-ray, computed tomography successfully identified a giant pleural-based mass-like consolidation with bronchial cut-off and significant mediastinal lymphadenopathy, raising strong suspicion of an underlying malignancy. The case emphasizes the importance of maintaining a high index of clinical suspicion and proceeding to advanced cross-sectional imaging when symptoms persist despite normal radiographic findings. Early CT evaluation can facilitate timely diagnosis, histopathological confirmation, accurate staging, and appropriate therapeutic intervention.

REFERENCES:

1. Sureka B, Thukral BB, Mittal MK, Mittal A, Sinha M. Radiological review of pleural tumors. *Indian J Radiol Imaging*. 2013;23(4):313-320. doi:10.4103/0971-3026.125573. PMID: 24604935.
2. Kim Y, Goo JM, Lee HJ, Kim HY, Park CM. Missed lung cancers on chest radiograph: an illustrative review of common blind spots on chest radiograph with emphasis on various radiologic presentations of lung cancers. *Korean J Radiol*. 2022;23(8):1032-1050. doi:10.3348/kjr.2021.0930.
3. Hwang JH, Song KS, Park SI, Lim TH, Kwon KH, Goo DE. Subtle pleural metastasis without large effusion in lung cancer patients: preoperative detection on CT. *Korean J Radiol*. 2005;6(2):94-101. doi:10.3348/kjr.2005.6.2.94. PMID:15968148.
4. Lee AHH, Macalister SJ, Yap KK. Pleural small cell lung cancer masquerading as malignant mesothelioma: A case report. *Radiol Case Rep*. 2024;19(8):2969-2972. doi:10.1016/j.radcr.2024.04.011. PMID:38737188.
5. Satria D, Prabowo AS, Prasetyo B, et al. A rare case of lung adenocarcinoma mimicking a primary pleural tumor. *Int J Surg Case Rep*. 2021;89:106628. doi:10.1016/j.ijscr.2021.106628.
6. Higgins JP, Shuttari M, Demmy T, Loy T, Calaluce R. Diffuse large cell lymphoma of the lung: an unusual cause of complete opacification of the hemithorax. *South Med J*. 1994;87(11):1183-1185. doi:10.1097/00007611-199411000-00029. PMID:7973913.
7. Kim Y, Goo JM. Missed lung cancer on chest radiography: imaging pitfalls and the complementary role of computed tomography. *Korean J Radiol*. 2022;23(8):1032-1050.