

Atypical Axillary Nodal Spread in Lung Carcinoma: Radiologic Insights from a Rare Case

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Abstract: Lung squamous cell carcinoma (SCC), a major subtype of non-small cell lung cancer (NSCLC), typically metastasizes to the brain, bone, adrenal glands, and liver. Axillary lymph node metastasis (ALNM) is exceedingly rare and often mimics breast malignancy, risking misdiagnosis. We present a rare case of a 74-year-old chronic smoker with isolated ALNM, brain, spinal, and retroperitoneal metastases without mediastinal involvement. Diagnosis was confirmed through ultrasound, mammography, contrast-enhanced CT (CECT), MRI, and fine-needle aspiration cytology (FNAC). Conclusion: This case underscores the need for radiologic vigilance to identify atypical metastatic patterns and avoid diagnostic errors.

Keywords: Axillary Lymph Node Metastasis, Lung Cancer, Brain Metastasis, Radiologic Correlation.

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I. INTRODUCTION

Lung cancer is the leading cause of cancer-related mortality globally, with 2.2 million new cases and 1.8 million deaths annually, according to GLOBOCAN estimates [1]. Non-small cell lung cancer (NSCLC) accounts for approximately 85% of cases, with squamous cell carcinoma (SCC) as a major histological subtype, often associated with smoking. At diagnosis, up to 40% of NSCLC cases present with distant metastases, typically involving the brain, bones, liver, and adrenal glands. Axillary lymph node metastasis (ALNM) is rare, with a prevalence of 0.61% to 0.75%, often identified in retrospective surgical series [2,3]. ALNM in lung cancer can easily masquerade as breast malignancy, risking misdirected workup unless radiologic vigilance is maintained. Delayed recognition of ALNM can lead to misdirected workup, particularly in elderly women, due to its overlap with breast cancer presentations.

This case report describes an unusual presentation of NSCLC with extensive necrotic axillary lymphadenopathy,

brain, spinal, and retroperitoneal metastases, notably without mediastinal nodal involvement. Such a metastatic pattern is rarely documented and highlights the importance of comprehensive radiologic evaluation.

II. CASE PRESENTATION

In February 2025, a 74-year-old woman with a 60-pack-year smoking history presented to the outpatient department with progressive right upper limb edema, chest wall discomfort, and recurrent headaches associated with transient visual blurring. Her medical history included treated pulmonary tuberculosis and chronic hypertension. Physical examination revealed Grade III digital clubbing and right upper limb edema, with no palpable breast masses.



Fig-1(A) Right Upper Limb Edema



Fig 1(B) Grade III Clubbing

No hormonal or mammographic signs suggestive of breast carcinoma (e.g., micro calcifications, architectural distortion) were identified, prompting further evaluation for a non-breast etiology.

➤ *Imaging Includes Ultrasonography, Computed Tomography (CT), Chest X-Ray, MRI.*

• *Ultrasonography:*

Ultrasound of the right breast and axilla revealed subcutaneous edema and multiple enlarged, hypoechoic lymph nodes in the axillary region, with short axis diameter measuring up to 3.3 cm, with central necrosis suggestive of metastasis.



Fig 2a

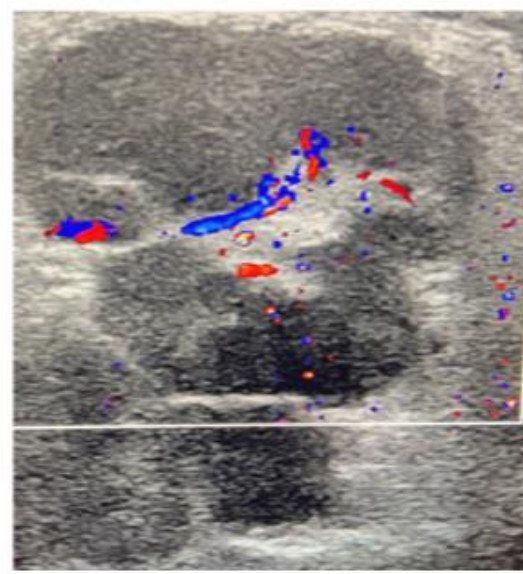


Fig 2b

Fig 2 (a) and 2 (b): Extensive Right Axillary Lymphadenopathy

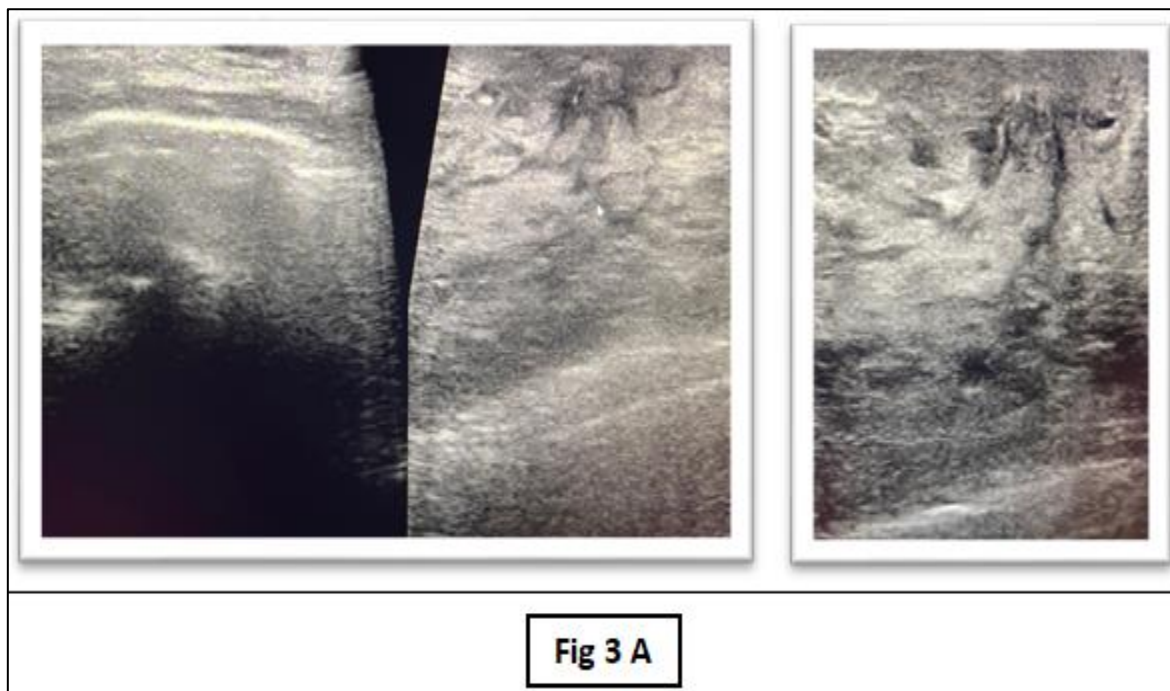


Fig 3A Skin Thickening Noted Involving the Chest Wall on Right Side. Dilated Veins and Subcutaneous Edema Seen Involving the Right Chest Wall, Upper Outer and Lower Outer Quadrants of Right Breast.

- *Mammography:*

Mammography confirmed skin thickening and edema over the right chest wall, with no mass lesions, consistent with lymphatic obstruction.

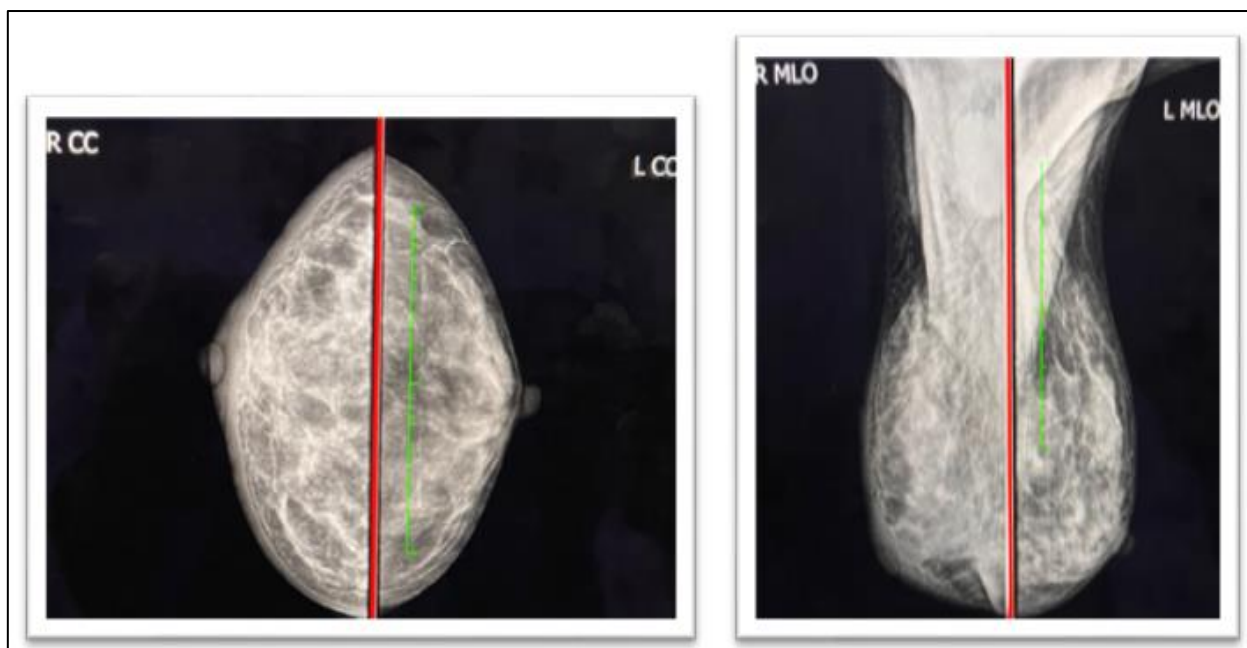


Fig 3B Mammography Revealed No Mass Lesion

- *FNAC of Right Axillary Lymph Node:*

Fine-needle aspiration cytology (FNAC) of the axillary nodes confirmed metastatic squamous cell carcinoma; immunocytochemistry (e.g., p40, CK5/6) was not performed due to resource constraints.

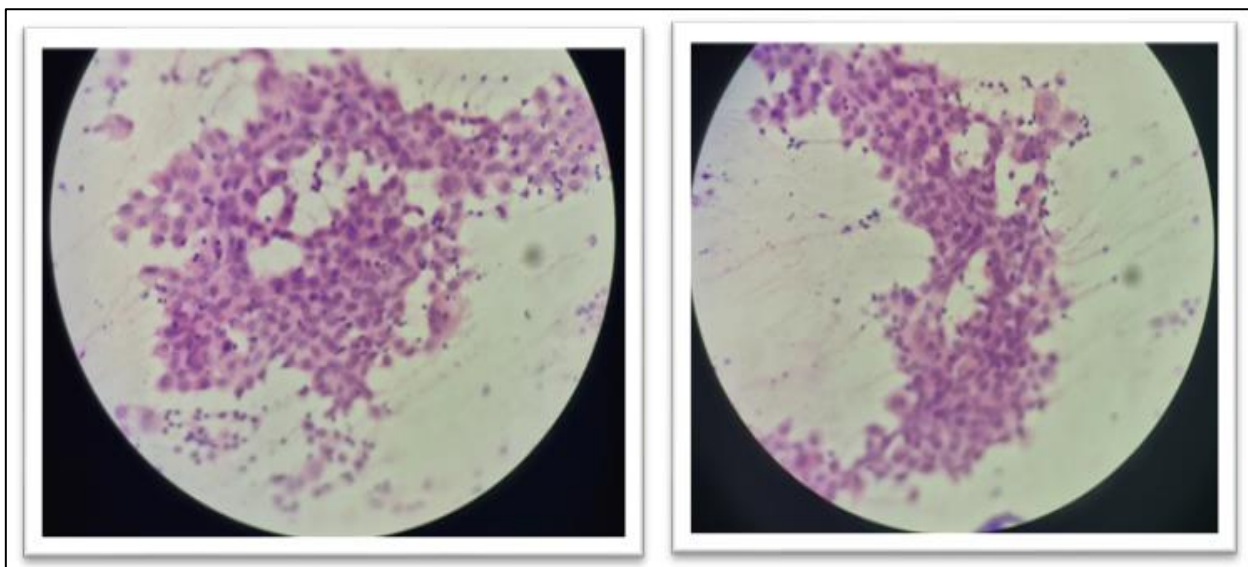


Fig 4 40x, H&E Stain Revealed Discretely Arranged Malignant Epithelial Cells with Increased Nucleo-Cytoplasmic Ratio and Multinucleate Giant Cells and Showing Marked Pleomorphism.

- *Chest X-Ray:*

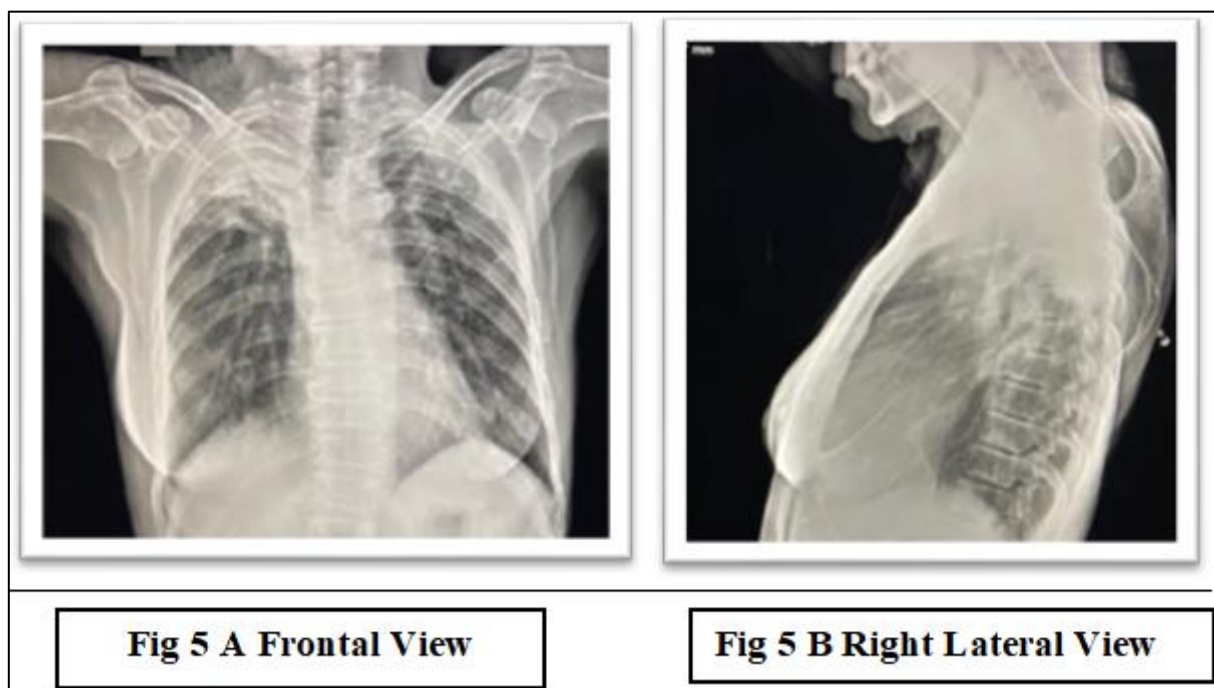


Fig 5 Chest Xray Revealed Mass Lesion in Right Upper Lobe with Spiculated Inferior Margins.

- *Contrast-enhanced CT:*

Contrast-enhanced CT (CECT) of the chest revealed a heterogeneously enhancing right upper lobe mass in the apical and posterior segments, without mediastinal or hilar lymphadenopathy.

CECT also confirmed necrotic right axillary lymph nodes compressing the subclavian vein, contributing to edema.

Axial contrast-enhanced CT of the chest shows necrotic right axillary lymph nodes (arrows), measuring up to 2.5 cm, compressing the subclavian vein, contributing to right upper limb edema, and suggestive of metastatic involvement.

PET-CT was not performed due to resource limitations. CECT of the abdomen identified a 3.5 cm retroperitoneal soft tissue lesion posterior to the left kidney, suggestive of metastasis.

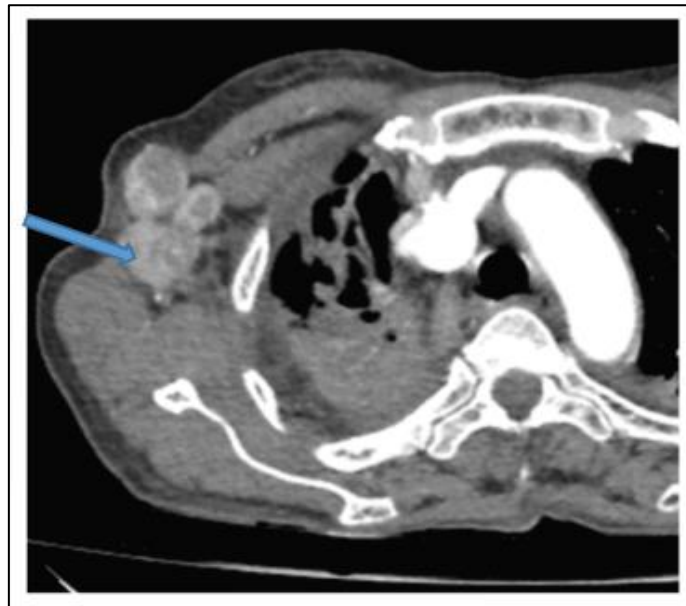


Fig 6A Necrotic Right Axillary Lymphadenopathy with Few Prominent Veins in the Right Anterior Chest Wall (✓)



Fig 6B Enlarged Lymph Nodes Compressing the Right Subclavian Vein (✓)

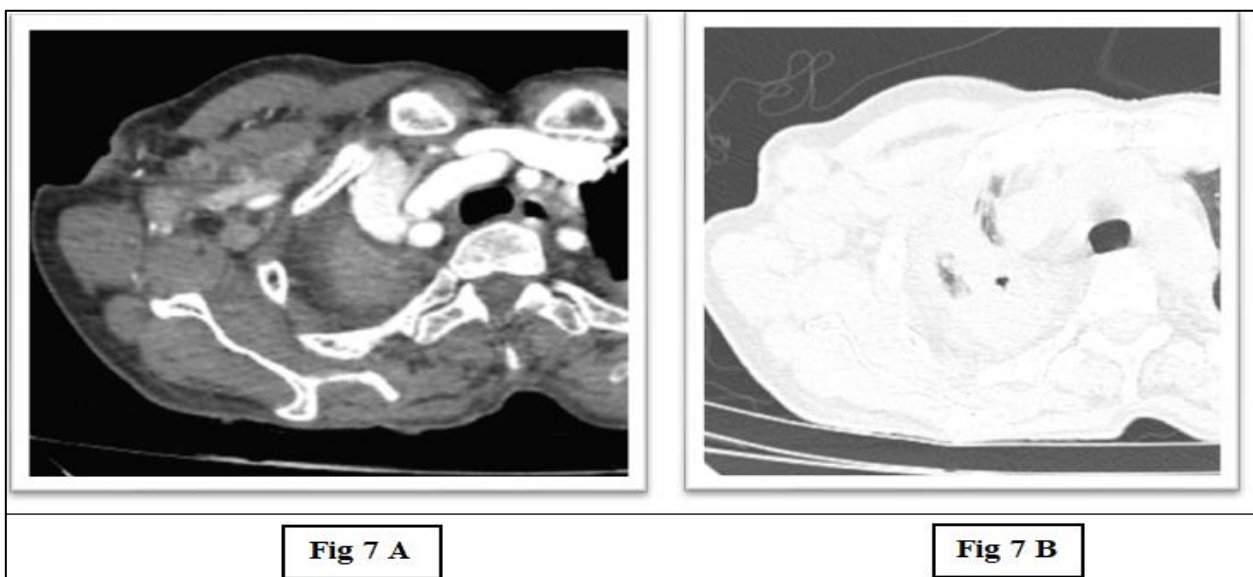


Fig 7 A

Fig 7 B

Fig 7 Right Upper Lobe Mass No Significant Mediastinal Lymphadenopathy Seen



Fig 8 Axial CECT Abdomen Shows Evidence of Heterogeneously Enhancing Lesion Posterior to Left Kidney - Likely Retroperitoneal Metastatic Deposit (↙)

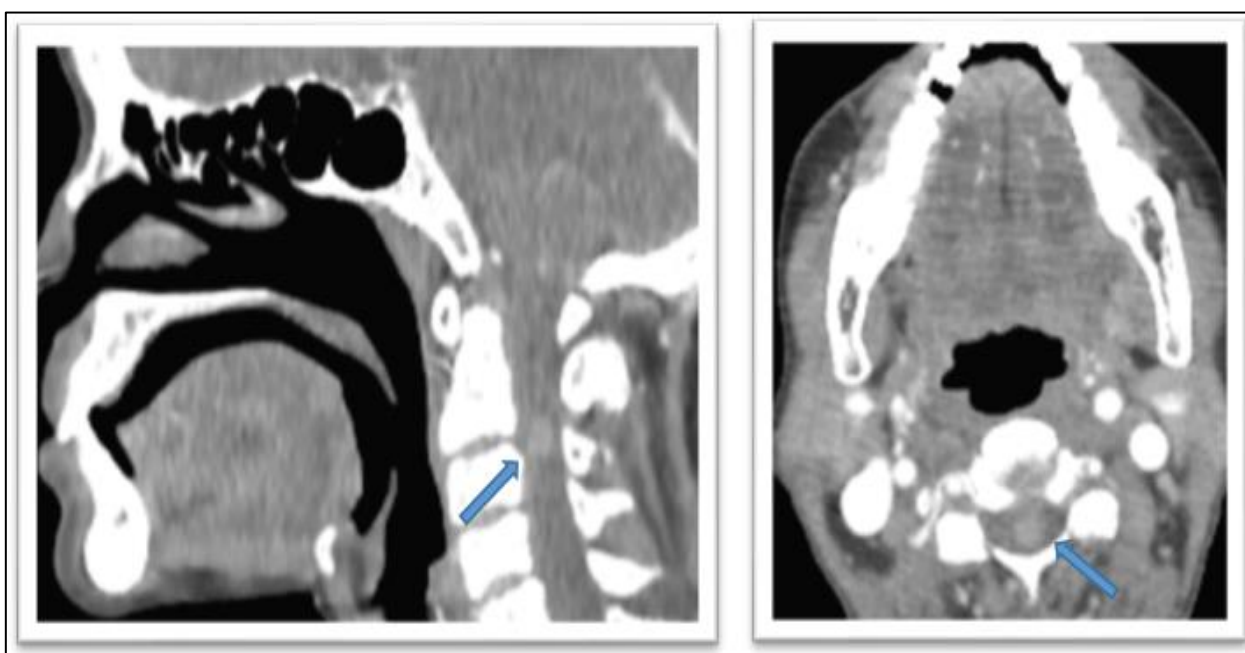


Fig 9 Sagittal and Axial CECT Brain Sections Showing Enhancing Intramedullary Lesion Seen at C2 - C3 Level - Likely Intramedullary Metastasis (↙)

• *MRI Brain:*

In view of the above imaging findings and history of headache, MRI Brain was performed which revealed

multiple focal lesions with disproportionate edema in left occipital lobe and right parietal lobe.

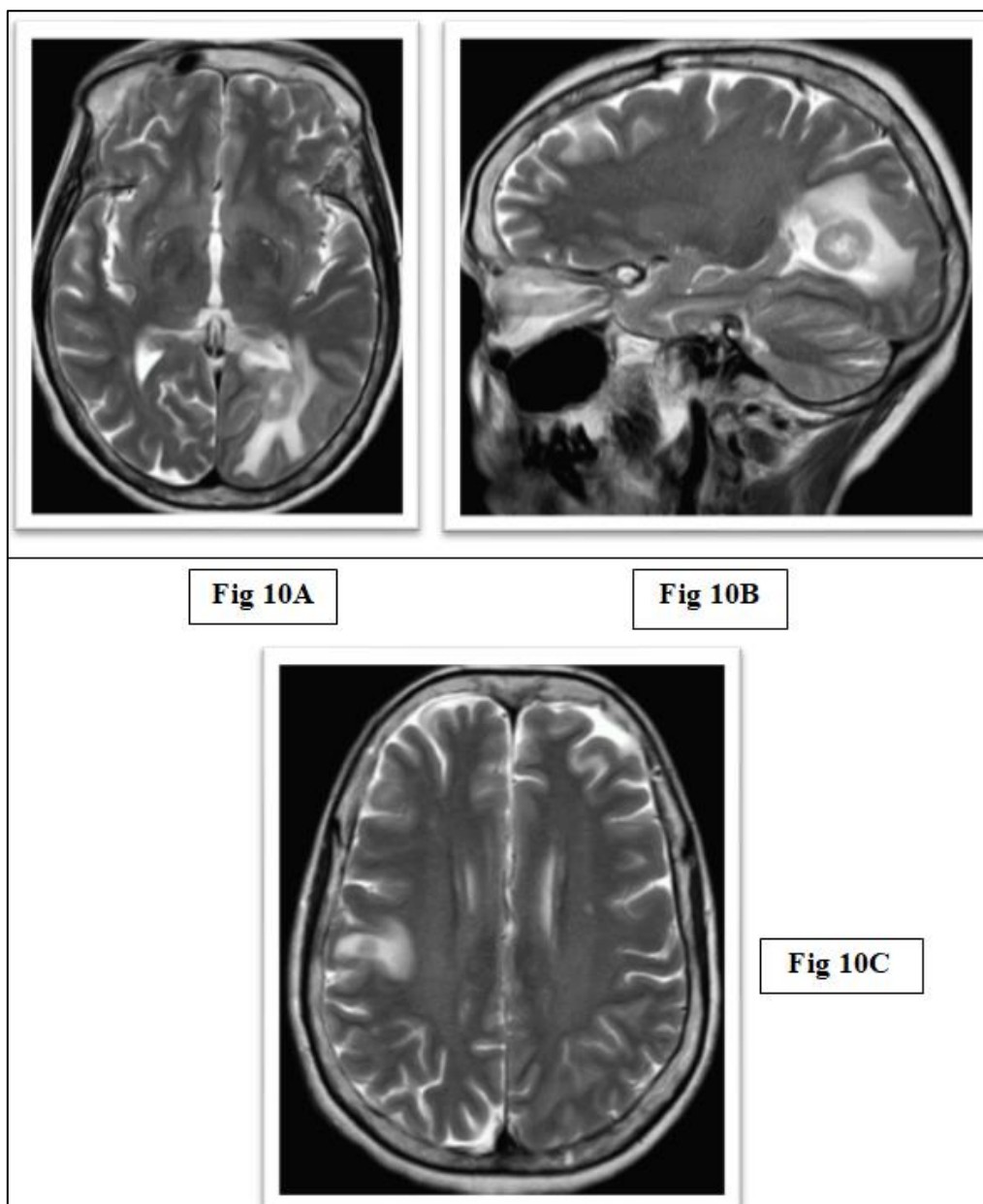


Fig 10 A , B : Axial and Sagittal Sections MRI Brain Showing Focal Lesions with Disproportionate Perilesional Edema in Left Occipital Lobe and in Right Parietal Lobe - Consistent with Brain Metastasis

FNAC of right upper lobe mass confirmed primary lung squamous cell carcinoma, consistent with the axillary node findings; immunocytochemistry (e.g., p40, CK5/6) was

not performed due to resource constraints. Future cases should attempt p40, CK5/6 for improved confidence.

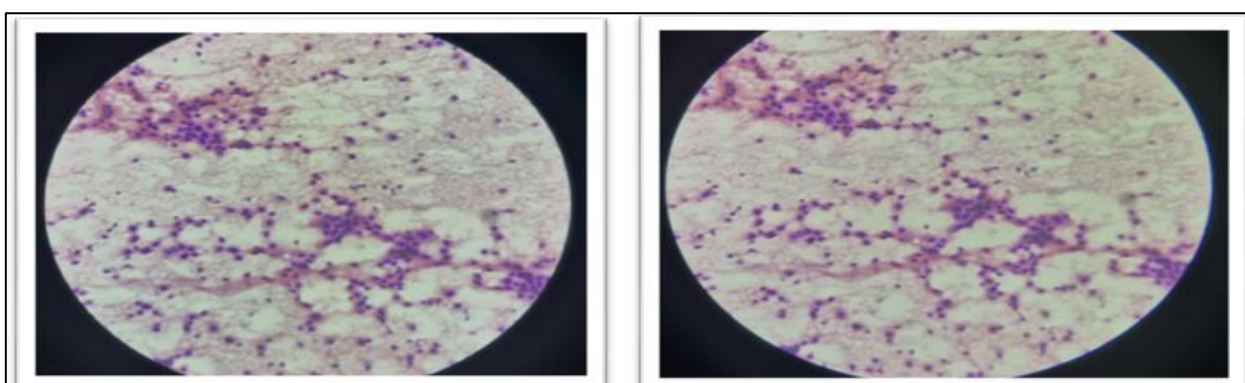


Fig 11 FNAC Lung Mass Reveals Discretely Arranged Malignant Epithelial Cells with Marked Pleomorphism

• **Final Diagnosis:**

Primary right upper lobe squamous cell carcinoma with axillary, brain, spinal, and retroperitoneal metastases.

Due to rapid clinical deterioration and poor performance status (ECOG 4), the patient was deemed unfit for definitive oncologic therapy. Palliative care was considered, but she succumbed to disease progression within one month of hospitalization.

III. DISCUSSION

Axillary lymph node metastasis (ALNM) is an uncommon manifestation of lung cancer and is classified as non-regional nodal metastasis (M1b) in the TNM 8th edition, rather than part of nodal staging [4].

Proposed mechanisms for ALNM include retrograde lymphatic spread due to supraclavicular lymph node blockage, direct extension from chest wall invasion, or spread via intercostal lymphatics, as described by the Ochsner–DeBaakey pathway, which involves drainage from the mediastinum to the axilla through intercostal lymphatic channels [5]. In this case, the absence of mediastinal and supraclavicular lymphadenopathy, coupled with axillary, brain, spinal, and retroperitoneal metastases, suggests hematogenous or atypical lymphatic dissemination.

The radiologic work-up was critical in distinguishing ALNM from mimics such as breast malignancy or lymphoma. Ultrasound and mammography ruled out a breast primary, while CECT, MRI, and FNAC confirmed

metastatic squamous cell carcinoma originating from the lung, reinforcing the diagnostic value of combining conventional imaging with FNAC to accurately localize the primary malignancy in cases of ALNM. This case shares similarities with rare reports of ALNM in NSCLC (Table 1).

Unlike Satoh et al., who described ALNM with bone metastases and mediastinal involvement [3], our patient exhibited mediastinal-sparing spread, similar to Ko et al., who identified BRAF-mutation-positive NSCLC with ALNM [6]. However, mutation testing in our case was unavailable due to resource constraints, highlighting a diagnostic gap in resource-limited settings.

Similar to other rare metastatic sites, such as the peritoneum or gastrointestinal tract, ALNM challenges conventional staging and management [8]. The rapid deterioration (death within one month) suggests that ALNM, particularly with brain, spinal, and retroperitoneal spread, may portend a poor prognosis, potentially reflecting aggressive tumor biology or delayed diagnosis due to atypical presentation. Early recognition and targeted therapies, such as EGFR or ALK inhibitors in mutation-positive squamous cell carcinoma cases, could improve outcomes, underscoring the need for molecular profiling [7].

The complementary use of ultrasound, mammography, CECT, and MRI was pivotal in establishing the diagnosis and guiding management. Radiologists play a critical role in recognizing atypical metastatic patterns and differentiating them from other etiologies, ensuring timely multidisciplinary intervention [8].

Table 1 ECOG – Eastern Cooperative Oncology Group

Author/ Year	Age / Sex	Smoking History	Metastatic Sites	Mediastinal Involvement	Mutation Status	Performance Status	Outcome
Current Case, 2025	74/F	60 pack years	Axilla, brain, spine, retroperitoneum	No	Not tested	ECOG 4	Death (1 month)
Satoh et al., 2009	68/M	Yes	Axilla, bone	Yes	Not reported	Not reported	Not reported
Ko et al., 2020	55/F	No	Axilla, lung	No	BRAF - positive	Not reported	Not reported
Riquet et al., 1998	60/M	Yes	Axilla	Yes	Not reported	Not reported	Not reported

IV. CONCLUSION

This case highlights the critical role of radiologic vigilance in identifying atypical metastatic patterns like ALNM in lung cancer, which can mimic breast malignancy and lead to diagnostic errors.

Routine axillary examination and targeted imaging strategies, including ultrasound, CECT, MRI, and mammography, are essential for accurate diagnosis.

Radiologists play a critical role in identifying these patterns through targeted imaging, ensuring timely diagnosis and facilitating coordinated multidisciplinary care.

Our case highlights the importance of radiologists to maintain suspicion for atypical spread patterns, especially in patients with risk factors like smoking and unexplained axillary lymphadenopathy.

DISCLOSURES

➤ **Acknowledgement**

We thank the Departments of Radiology, Pathology, and General Surgery, and the patient, for their cooperation.

We thank the Departments of Radiology, Pathology, and General Surgery at NRI Institute of Medical Sciences, and the patient, for their cooperation.

➤ *Conflict of Interest*

None declared.

➤ *Funding*

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➤ *Institutional*

NRI Institute of Medical Sciences, Visakhapatnam, India.

➤ *Ethical Committee*

Not applicable. Case reports based on de-identified clinical findings do not require IEC approval.

➤ *Approval Number*

N/A

➤ *Informed Consent*

Informed written consent was obtained from the patient for publication of clinical details and images.

➤ *Author's Contribution*

Dr. Perugu Lakshmi Lavanya: Conducted literature review, selected images, and drafted the manuscript

Dr. Bhamidipaty Kanaka Durga Prasad: Provided supervision, conceptualized the case, and approved the final draft

Dr. Rokkam Sasidhar: Interpreted radiologic findings and assisted in manuscript editing

➤ *Data Availability*

All data related to this case report are included in the manuscript. Further details available upon request.

➤ *Use of Artificial Intelligence*

No generative AI tools were used in the preparation of this manuscript.

- [7]. Mercedes L Dalurzo ,Testing for EGFR Mutations and ALK Rearrangements in Advanced Non-Small-Cell Lung Cancer: Considerations for Countries in Emerging Markets. *Onco Targets Ther.* 2021 Sep 1;14:4671–4692. doi: 10.2147/OTT.S313669
- [8]. Xiayao Diao ,Chao Guo . Lymphatic metastasis in non-small cell lung cancer: recent discoveries and novel therapeutic targets.*Cancer Commun (Lond).* 2022 Nov 9;42(12):1403-1406
- [9]. Narjust Duma , Rafael Santana-Davila.Non-Small Cell Lung Cancer: Epidemiology, Screening, Diagnosis, and Treatment. *Mayo Clin Proc.* 2019 Aug;94(8):1623-1640.
- [10]. Reck M, Rabe KF. Precision diagnosis and treatment for advanced non-small-cell lung cancer. *N Engl J Med* 2023;389(8):738-51.

REFERENCES

- [1]. Siegel RL, Miller KD, Wagle NS, Jemal A. Cancer statistics, 2024. *CA Cancer J Clin* 2024;74(1):12-49.
- [2]. Riquet M, Le Pimpec-Barthes F, Danel C. Axillary lymph node metastases from bronchogenic carcinoma. *Ann Thorac Surg* 1998;66(3):920-22.
- [3]. Satoh H, Ishikawa H, Kagohashi K, Kurishima K, Sekizawa K. Axillary lymph node metastasis in lung cancer. *Med Oncol* 2009;26(2):147-50.
- [4]. Detterbeck FC, Boffa DJ, Kim AW, Tanoue LT. The eighth edition lung cancer stage classification. *Chest* 2017;151(1):193-203.
- [5]. Ochsner A, DeBakey M. Significance of metastasis in primary carcinoma of the lungs: Report of Two Cases With Unusual Site of Metastasis *Journal of Thoracic Surgery* Volume 11, Issue 4, April 1942, Pages 357-387.
- [6]. SH McEvoy , DF Halpenny. Investigation of patterns of nodal metastases in BRAF mutant lung cancer. *Lung Cancer.* 2017 Mar 1;108:62–65