

A Case of Persistent Headache Leading to Diagnosis of Lung Adenocarcinoma: An Atypical Presentation

MANASI HARALE¹, ARUN BIJU², BHAVYA SRI YAMMANURU³, SREEVIDYA YEKKALURU⁴

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ABSTRACT

Lung adenocarcinoma is a primary type of lung cancer and is classified as a non small cell lung carcinoma. Headache is a rare presentation of lung carcinoma. This case report found that early diagnosis and proper treatment can improve disease outcomes. The case describes a 36-year-old woman presenting with a persistent left-sided headache and non radiating pain. Despite normal vital signs and laboratory results, an Magnetic Resonance Imaging (MRI) revealed multifocal abnormalities in the brain, suggesting neoplastic metastasis. Further investigations, including Computed Tomography (CT) scans and Positron Emission Tomography-Computed Tomography PET-CT scans, confirmed lung adenocarcinoma with metastases to the brain, bone, and liver. Histopathology revealed an invasive, moderately-differentiated adenocarcinoma. The patient was recommended palliative radiation therapy, and after compliance with treatment, she was discharged. The present case underscores the importance of thorough diagnostic evaluation in unexplained symptoms, leading to the identification of advanced-stage lung adenocarcinoma with multiple metastases.

Keywords: Early diagnosis, Magnetic resonance imaging, Metastasis

CASE REPORT

A 36-year-old woman presented with a one-month history of left-sided headache, non radiating pain, and vomiting unrelated to meals. She denied chest pain, dyspnoea, or breathlessness. Vital signs were within normal limits: temperature 98°F, blood pressure 110/70 mmHg, oxygen saturation 97% on room air, respiratory rate 20 cycles per minute, and pulse rate 80 beats per minute. Serology for Hepatitis B, C, and Human Immunodeficiency Virus (HIV), as well as lipid profile, were unremarkable [Table/Fig-1]. Abdominal and pelvic ultrasonography revealed no abnormalities. Neurological examination demonstrated intact higher functions and cranial nerves, normal muscle tone and strength (5/5 in all extremities), and normal reflexes. No bladder or bowel involvement was noted, and respiratory and cardiovascular examinations were unremarkable.

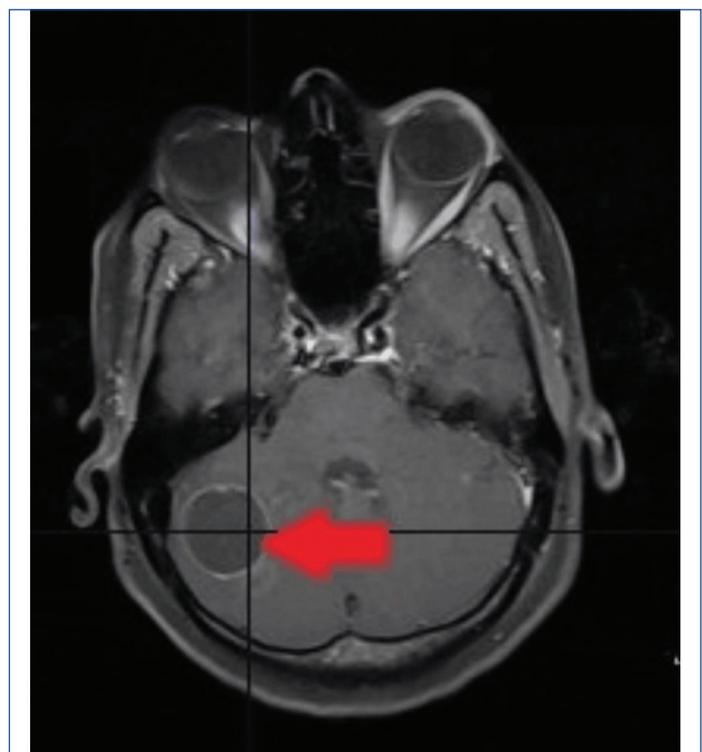
Parameters	Day 1	Normal limit
Haemoglobin	13.7 gm/dL	13.2-16.6 gm/dL
Total leucocyte count	6700/ μ L	4,000-10,000/ μ L
Platelets	2,04,000/ μ L	1,50,000-4,10,000/ μ L
Serum urea	28 mg/dL	17-49 mg/dL
Serum creatinine	0.77 mg/dL	0.6-1.35 mg/dL
SGOT	30 IU/L	8-48 IU/L
SGPT	22 IU/L	7-55 IU/L
Serum ALP	45 IU/L	40-129 IU/L
Serum bilirubin	0.80 mg/dL	0.2-1.2 mg/dL
Serum albumin	4.1 gm/dL	3.4-4.8 gm/dL
INR	0.85	0.85-1.15
HIV/HbsAg/HCV-Ab	Non reactive	Non reactive
Random blood sugar level	96 mg/dL	Upto 140 mg/dL

[Table/Fig-1]: Laboratory investigations.

SGOT: Serum glutamic-oxaloacetic transaminase; SGPT: Serum glutamic pyruvic transaminase; ALP: Alkaline phosphatase; INR: International normalised ratio; HIV: Human immunodeficiency virus; HbsAg: Hepatitis B antigen; HCV-Ab: Hepatitis C antibody

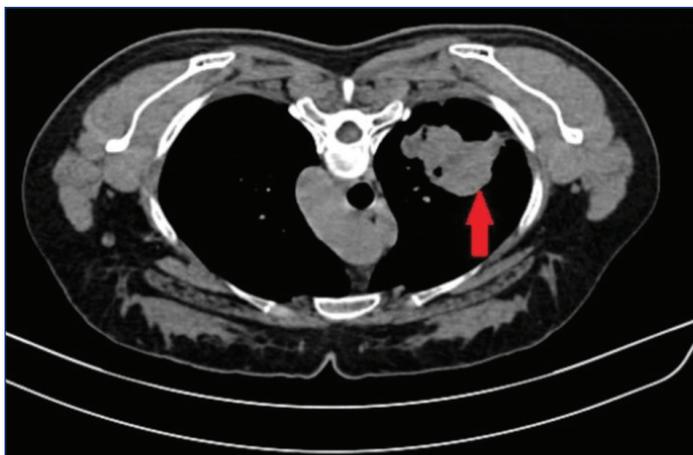
Given the lack of response to Non Steroidal Anti-inflammatory Drugs (NSAIDs), MRI of the brain was performed, revealing multifocal abnormalities in subcortical and cortical white matter. Contrast-

enhanced MRI spectroscopy suggested metastatic neoplasia [Table/Fig-2]. Chest X-ray revealed consolidation with poorly defined margins in the right upper lobe, confirmed by plain CT thorax, which also identified a lobulated soft tissue density mass with bronchial cut-off [Table/Fig-3]. Pleural tags and thickening favoured a neoplastic aetiology over infection.

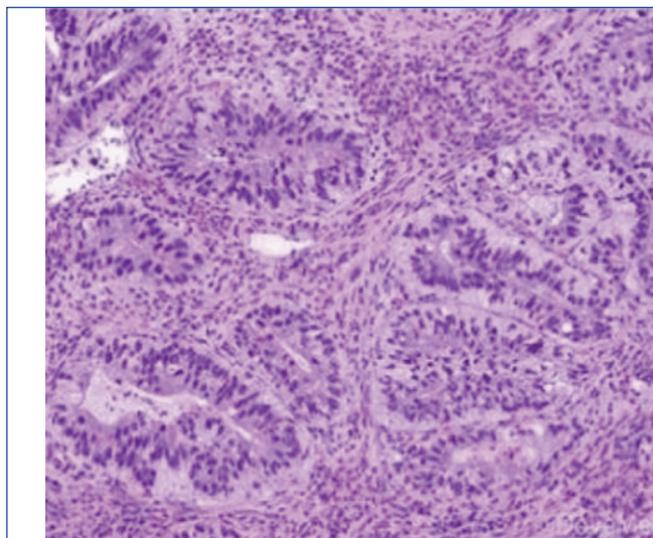


[Table/Fig-2]: Contrast-enhanced MRI Spectroscopy brain axial view showing lesion (red arrow) in right cerebellar hemisphere. MRI: Magnetic resonance imaging

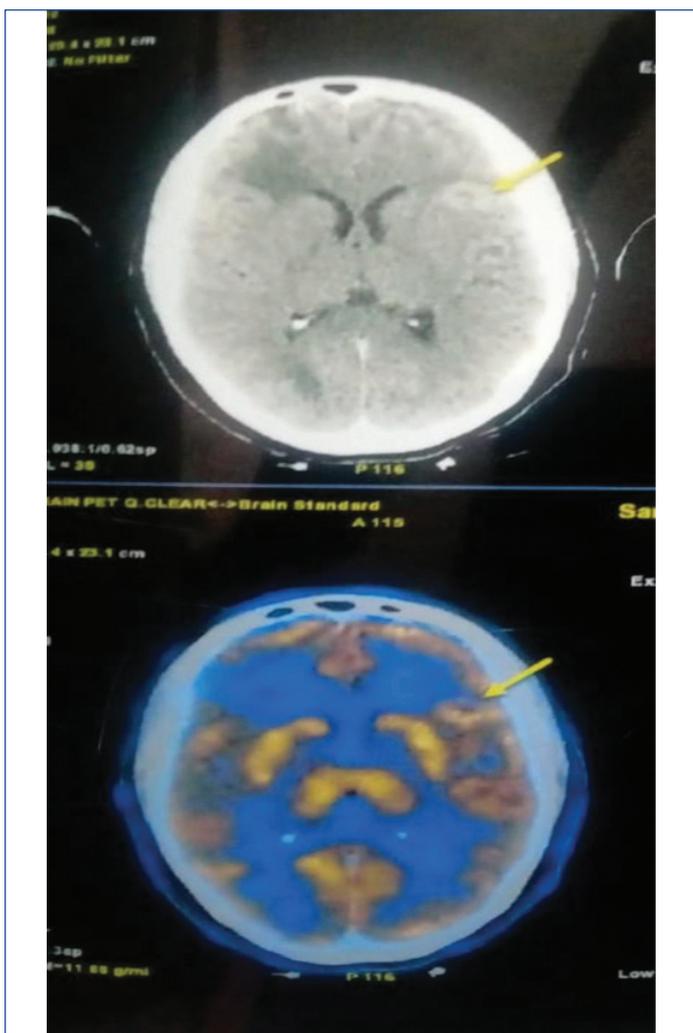
Whole-body PET-CT [Table/Fig-4] demonstrated lesions in the brain, lungs, liver, and left iliac bone. CT-guided biopsy of the lung lesion revealed moderately-differentiated invasive adenocarcinoma of the acinar type [Table/Fig-5].



[Table/Fig-3]: HRCT thorax axial view showing mass in left lung (red arrow).
HRCT: High-resolution computed tomography



[Table/Fig-5]: Histopathological examination of the biopsy taken from the left lung mass shows cells arranged in small clusters and vague glandular pattern with individual tumour cells showing moderate nuclear pleomorphism, vesicular nuclei and distinct nucleoli suggestive of acinar type moderately-differentiated invasive adenocarcinoma (H&E, 10X).



[Table/Fig-4]: PET-CT of brain axial view showing metastatic lesion (yellow arrow).
PET-CT: Positron emission tomography-computed tomography scan

The final diagnosis was lung adenocarcinoma with metastases to bone, brain, and liver. The patient was recommended palliative radiation therapy, initially once weekly for twelve weeks, then three times weekly for four weeks. After two weeks of treatment, she was discharged with outpatient follow-up.

The present case underscores the importance of considering atypical presentations of lung adenocarcinoma and the necessity for a comprehensive diagnostic evaluation to guide appropriate management.

DISCUSSION

Lung cancer, particularly lung adenocarcinoma, stands as the most common type of primary lung malignancy and a significant cause

of cancer-related morbidity and mortality worldwide [1]. Falling under Non small Cell Lung Cancer (NSCLC), lung adenocarcinoma is strongly associated with smoking habits and typically arises from mucosal glands, constituting approximately 40% of all lung cancers [2]. It is noteworthy that adenocarcinoma is also the most prevalent subtype in individuals with no history of smoking. Genetic mutations within the p53 gene are the primary drivers of tumourigenesis within NSCLC, detected in nearly 52% of cases [3]. Treatment options vary depending on operability, with surgical resection recommended when feasible and structured radiotherapy with adjuvant chemotherapy considered otherwise. Radiotherapy is particularly indicated in cases with a high-risk of positive lymph nodes, and neoadjuvant chemoradiation may be employed in certain cases of definitive invasive tumours before resection [1].

A notable complication of lung adenocarcinoma is its potential to metastasise to the brain, leading to neurological symptoms such as headaches. These metastatic brain lesions can present with symptoms like those of primary neurological disorders, including severe, persistent headaches that may not necessarily be associated with other common symptoms like vomiting [4,5]. This sets the stage for a discussion on the mechanism by which lung adenocarcinoma metastasises to the brain, contributing to the presentation of headaches and other neurological manifestations, and highlighting the intricate relationship between primary lung tumours and secondary brain involvement [6].

The patient's presentation with a left-sided headache, non radiating and devoid of vomiting symptoms, is a common clinical complaint. In a previous review of similar cases, facial pain rather than headache is almost always unilateral and most commonly localised to the ear, jaw, and temporal region. The pain is frequently described as severe and aching and may be continuous or intermittent. This type of pain is often associated with metastatic spread from lung cancer [7]. It is crucial to consider possible causes and tailor treatment accordingly. Despite normal laboratory values and vital signs, differential diagnosis such as cluster headaches, primary headache disorder, tension headaches, and sinusitis warrant consideration based on her test results. Tension headaches and migraines are prevalent conditions characterised by unilateral, non radiating pain. Unlike some other headache disorders, they do not always accompany additional symptoms, such as vomiting [2,8,9]. Similar cases from the literature showing unusual initial manifestations of lung malignancy have been tabulated in [Table/Fig-6] [10-16].

If headaches persist or remain unresponsive to analgesic treatment, it is imperative to maintain a heightened level of suspicion for

Name of the author	Year of study	Place of study	Age (in years)	Sex	Initial manifestation	Type of lung malignancy
Waran E [10]	2015	Australia	62	Male	Orthostatic hypotension	Squamous cell carcinoma
Jakhar SL et al., [11]	2021	Rajasthan	70	Male	Phalanx bone metastasis	Adenocarcinoma
Pajaziti L et al., [12]	2015	Albania	45	Male	Skin metastasis	Small cell carcinoma
Acciavatti A et al., [13]	2013	Italy	82	Male	Paraneoplastic necrotising myopathy	Adenocarcinoma
Papakonstantinou E et al., [14]	2016	Germany	43	Female	Dermatomyositis	Adenocarcinoma
Kamath YS et al., [15]	2012	Manipal	40	Male	Choroidal metastasis	Non small cell lung carcinoma
Yildiz O et al., [16]	2011	Turkey	50	Male	Facial nerve paralysis	Small cell carcinoma

[Table/Fig-6]: Similar cases from the literature showing unusual initial manifestations of lung malignancy [10-16].

underlying conditions. In such cases, neuroimaging, such as MRI or CT scans, should be promptly considered to identify any potential intracranial abnormalities or other serious issues contributing to the patient's symptoms. This approach ensures early detection and appropriate management of any underlying pathologies.

It is critical for healthcare providers to regularly monitor the patient's situation and initiate thorough clinical tests to gather more data and make a proper diagnosis. Detailed medical reports, along with any recent changes or stressors in her life, can offer significant insights into the possible causes of the intense headache. The comprehensive approach to diagnosis and management is essential in optimising patient outcomes and improving overall quality of life.

CONCLUSION(S)

The present case report of a patient with persistent headaches, unresponsive to NSAIDs, culminates in the diagnosis of lung adenocarcinoma with metastases to the bone, brain, and liver, following extensive investigations including MRI, chest X-ray, CT thorax, and PET-CT, complemented by a confirmatory CT-guided biopsy. The case emphasises the critical importance of a thorough diagnostic process in the presence of non specific symptoms, showcasing the necessity of advanced imaging and histopathological confirmation in identifying underlying malignant aetiologies. It highlights the value of a multidisciplinary approach to management, focusing on tailored palliative care to enhance the patient's quality of life in advanced disease stages. The present case serves as a poignant reminder of the need for vigilance and comprehensive evaluation in patients with atypical presentations.

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PARTICULARS OF CONTRIBUTORS:

- Associate Professor, Department of Internal Medicine, Dr. D. Y. Patil Medical College, Pune, Maharashtra, India.
- Resident, Department of Internal Medicine, Dr. D. Y. Patil Medical College, Pune, Maharashtra, India.
- Resident, Department of Internal Medicine, Dr. D. Y. Patil Medical College, Pune, Maharashtra, India.
- Resident, Department of Internal Medicine, Dr. D. Y. Patil Medical College, Pune, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Arun Biju,
C2 704, Mahindra Antheia, Pimpri, Pune-411018, Maharashtra, India.
E-mail: arunbiju3010@gmail.com

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