East African Scholars Journal of Medical Sciences
Abbreviated Key Title: East African Scholars J Med Sci
ISSN: 2617-4421 (Print) & ISSN: 2617-7188 (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-9 | Issue-5 | May-2026 | DOI: https://doi.org/10.36349/easms.2026.v09i05.008

Case Report

Left Atrial Invasion of Lung Carcinoma: A Case Report

Sotondovo Sena Jeanine Emerite[1]*, Amchaarou Hanaa[2], Feniche Noura[3], Eyene Eyene Lambert Florent[4], El Minaoui Mohamed[5], Martynov Alesey Yu.[6]

[1]Department of Hospital Therapy, Peoples' Friendship University of Russia named after Patrice Lumumba, Moscow, Russian Federation
[2]Cardiology Department, University Hospital Agadir, Medical School of Medicine & Pharmacy Ibn Zohr University, Agadir, Morocco
[3]Cardiology Department, Alençon-Mamers intercommunal Hospital Center, Alençon, France
[4]Pneumology Department, Alençon-Mamers intercommunal Hospital Center, Alençon, France
[5]Cardiology Department, University Hospital Agadir, Medical School of Medicine & Pharmacy Ibn Zohr University, Agadir, Morocco
[6]Department of Hospital Therapy, Peoples' Friendship University of Russia named after Patrice Lumumba, Moscow, Russian Federation

Article History
Received: 23.08.2025
Accepted: 09.10.2025
Published: 22.05.2026

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: Secondary cardiac tumors are rare and severe conditions, usually occurring in the advanced stages of primary cancer and consequently associated with a poor prognosis. Their clinical presentations are variable and often misleading. We report the case of a 50-year-old man who presented to the emergency department with dyspnea and a deteriorated general condition. Initial echocardiographic evaluation revealed a mass in the left atrium extending into the pulmonary veins. The final diagnosis was pulmonary adenocarcinoma with atrial invasion. We describe the clinical scenario and management, and provide a brief review of the literature.

Keywords: Left Atrial Invasion, Lung Carcinoma, Adenocarcinoma, Pulmonary Veins, Diagnosis, Prognosis.

INTRODUCTION

Globally, lung cancer remains the leading cause of cancer-related mortality in both men and women, accounting for an exceedingly high mortality rate worldwide [1]. Lung cancer that invades the heart typically has a terrible prognosis, and treating such instances is more difficult. Heart metastases are extremely uncommon; in one study, just 3.1% of 4,668 individuals with lung cancer had cardiac metastases [2]. The most common metastatic pathway to the heart is lymphatic spread, although hematogenous dissemination can also occur [3].

In this report, we describe an unusual case of left atrial invasion by pulmonary carcinoma, extending through the pulmonary vein.

OBSERVATION

A 50-year-old male restaurant owner presented to the emergency department of the Alençon-Mamers Intercommunal Hospital Center, with progressively worsening dyspnea and a dry cough exacerbated by changes in position. The symptoms occurred in an afebrile context and were associated with marked constitutional deterioration, including asthenia, anorexia, and an unintentional weight loss exceeding 10 kg over the preceding five months.

His past medical history was notable for a left-sided spontaneous pneumothorax managed by chest drainage 10 years earlier with complete recovery. He was an active smoker with a 30 pack-year history.

On physical examination, the patient was alert and hemodynamically stable but displayed poor overall condition (WHO performance status 2). He was tachypneic at 21 breaths per minute. Pulmonary auscultation revealed signs of a large right pleural effusion, while cardiovascular examination was unremarkable.

A chest radiograph revealed complete right lung opacification **(Figure 1).**

***Corresponding Author:** Sotondovo Sena Jeanine Emerite
Department of Hospital Therapy, Peoples' Friendship University of Russia named after Patrice Lumumba, Moscow, Russian Federation.

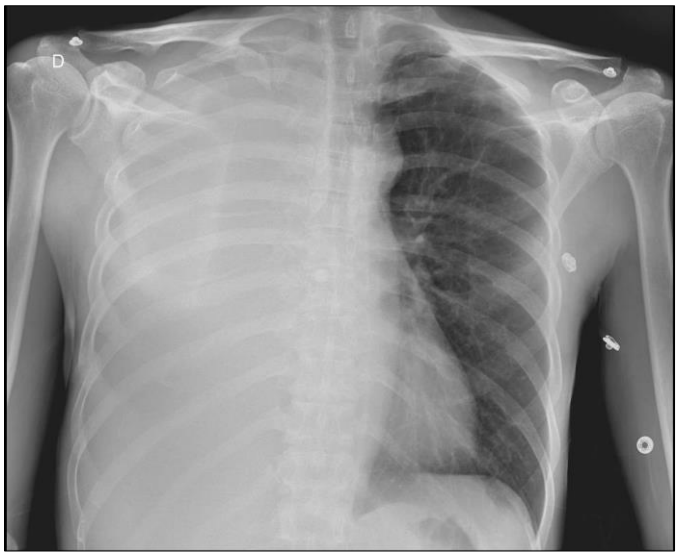

Figure 1: Chest X-ray of the patient

Given these findings, and in view of elevated D-dimer levels, a thoracic CT angiography was performed. This demonstrated an endoluminal obstruction of the right main bronchus by soft tissue, resulting in complete right lung atelectasis. Additional findings included a thrombus in the right middle lobar pulmonary artery, multiple dense and well-defined pulmonary nodules in the left lung, and a large soft-tissue mass invading the left atrium with extension into the ipsilateral pulmonary veins. Enlarged mediastinal lymph nodes were identified, measuring up to 10 mm in the subaortic region and 12 mm in the subcarinal space, together with a large right pleural effusion.

Transthoracic echocardiography (TTE) confirmed the presence of a mass occupying more than two-thirds of the left atrium, extending into the pulmonary veins without prolapse into the left ventricle. The lesion measured 4.6 × 3.2 cm at its largest diameter. There was no chamber dilatation and no impairment of biventricular systolic or diastolic function. No significant mitral or aortic valvulopathy was observed. Pulmonary artery systolic pressure was estimated at 31 mmHg, with a tricuspid regurgitant jet velocity of 2.56 m/s **(Figure 2,3).**

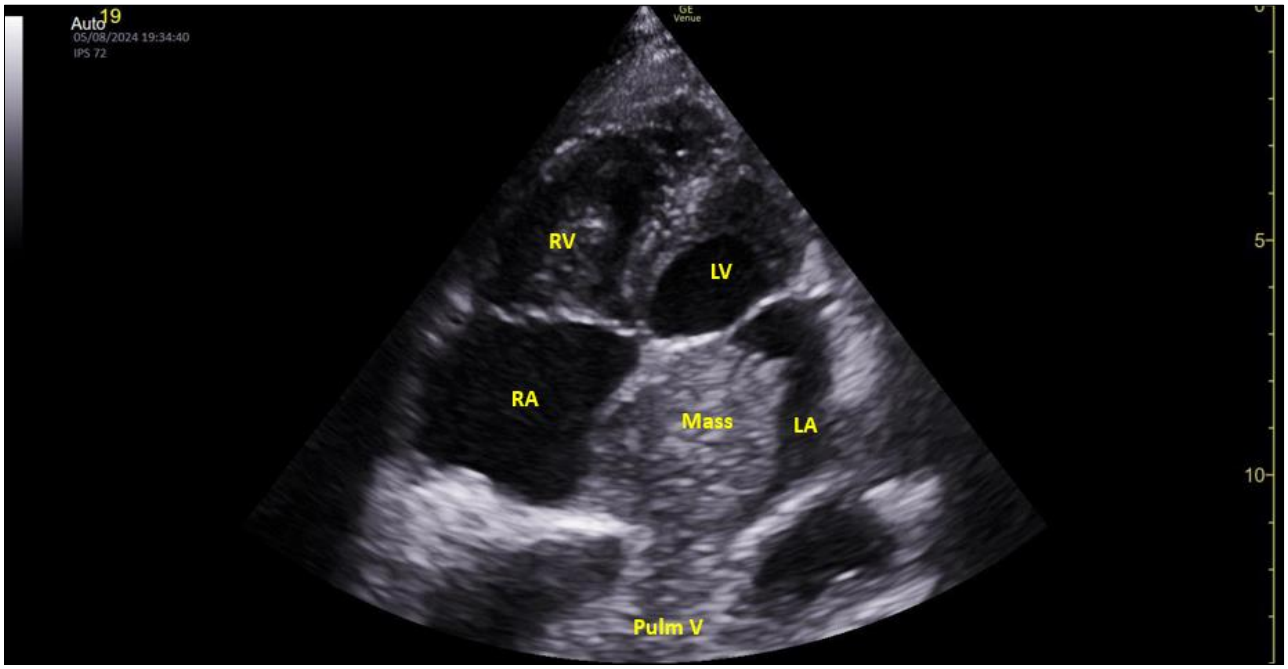

Figure 2: Four-chamber apical view on transthoracic echocardiography showing a mass located in the left atrium (LA) extending into the pulmonary veins (TTE)

LA: Left atrium; LV : Left ventricle ; Pulm V : Pulmonary vein ; RV : Right ventricle ; RA : Right atrium

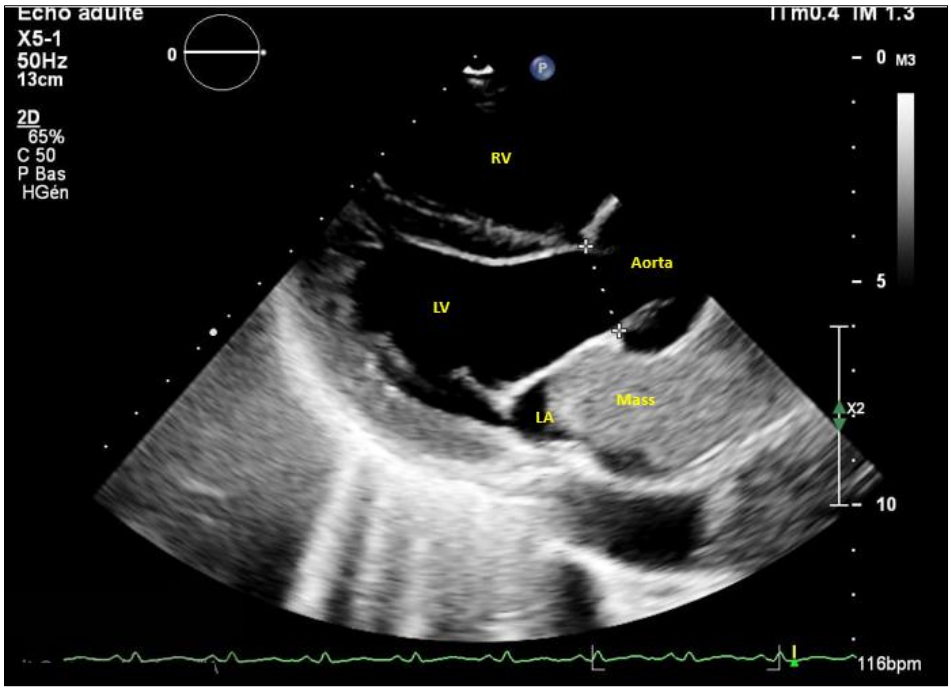

Figure 3: Parasternal long axis view revealing a mass in the left atrium (TTE)
LA: Left atrium; LV: Left ventricle; RV: Right ventricle

Positron emission tomography–computed tomography (PET-CT) revealed intense hypermetabolism of the large necrotic right pulmonary mass infiltrating the ipsilateral mediastinum, with suspected contiguous invasion of the left atrium. Additional hypermetabolic foci were noted in the left upper lobe and lingular nodules, consistent with secondary involvement. Brain CT excluded intracranial metastasis **(figure 4)**.

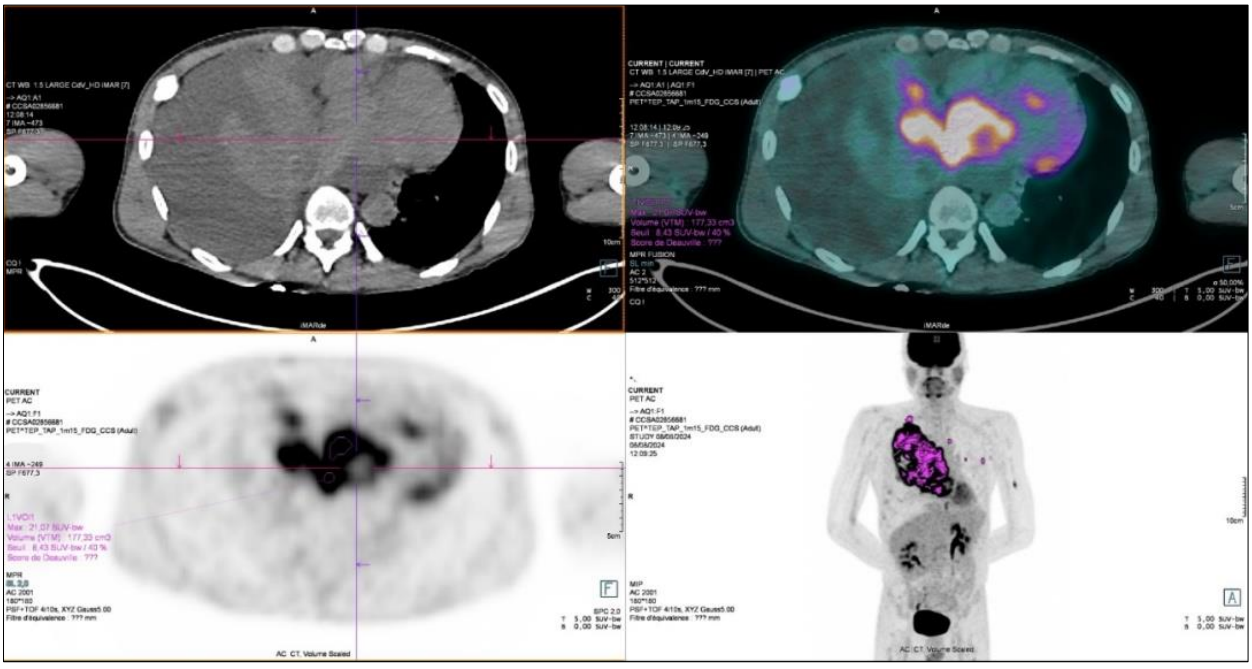

Figure 4: Positron emission tomography–computed tomography (PET-CT) of the patient

Bronchoscopic evaluation revealed a necrotic, obstructive endobronchial tumor arising from the right main bronchus with carinal thickening. Multiple biopsies were obtained, which confirmed the diagnosis of pulmonary adenocarcinoma. Molecular testing was negative, while PD-L1 expression was greater than 50%.

The patient was initially anticoagulated. His case was subsequently reviewed in a multidisciplinary

tumor board, which concluded that there was no surgical indication given the advanced stage of the disease. Chemotherapy and immunotherapy with cisplatin, pemetrexed, and pembrolizumab were initiated. Unfortunately, the patient died four months later.

DISCUSSION

Although relatively rare, metastatization of pulmonary neoplasm to the left atrium has been well documented, particularly in patients with primary lung cancer [4, 5]. Direct lung extension of left atrial tumors through pulmonary veins is rare, and the literature search reveals more sarcoma cases than direct lung extension of bronchogenic carcinoma [6].

According to the TNM classification, tumors that immediately infiltrate the left atrium are classified as stage T4, which indicates that they are inoperable. Although lymphatics are frequently the metastatic route to the heart, hematogenous patterns can also be seen [7]. In particular, there are two primary ways that left atrial invasion typically happens: direct penetration of cardiac tissue by proximity [8-10], and extension into the left atrium via the lymphatics and/or the pulmonary veins [11-18].

From a clinical standpoint, the first clinical manifestation in patients is usually lung cancer symptoms (e.g., cough, hemoptysis, and weight loss), or sometimes cardiac issues [19]. Numerous complications, including pulmonary venous obstruction [20], cardiac tamponade [21], ventricular arrhythmias [22], complete atrioventricular block [23], left ventricular outflow obstruction [24], and myocardial infarction [25], can result from a potentially fatal invasion of the left heart. Additionally, thrombus development in the pulmonary artery due to the tumor's direct invasion of the artery has been reported [26].

An involvement of the proximal region of the pulmonary veins and an extension into the left atrium were discovered in 9 (4.2%) and 2 (0.9%) of the 215 lung cancer patients examined by gadolinium-enhanced 3D magnetic resonance angiography in a prior review. [7]. Similarly, a more recent retrospective analysis of 4668 patients who underwent surgery for lung cancer found pathological evidence of pulmonary vein and left atrial involvement in 34 (0.7%) and 25 (0.5%) subjects, respectively [2].

In terms of therapeutic alternatives, immunotherapy seems to be a viable choice for treating cardiac metastases brought on by cancerous tumors [27]. However, even if cardiac involvement is often associated with a bad prognosis, treatment plans should still take a careful look at possible surgical procedures. Following a thorough clinical assessment, the patient was deemed too dangerous for thoracic surgery. Moreover, postoperative mortality is comparatively high, and total tumor removal is not always feasible. Palliative measures to ease heart compression or hemodynamic blockage, if appropriate, and cautious anticoagulant therapy are typically the only cardiac treatments available in such situations.

Left atrial invasion by lung carcinoma is an exceptional and severe presentation of advanced lung cancer. This case highlights the importance of multimodal imaging in establishing an early and accurate diagnosis. Despite therapeutic advances, prognosis remains poor once cardiac involvement occurs. Early detection and multidisciplinary management remain essential to improve outcomes.

REFERENCES

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2018;68(6):394-424. doi:10.3322/caac.21492
2. Riquet M, Grand B, Arame A, Pricopi CF, Foucault C, Dujon A, et al. Lung cancer invading the pericardium: quantum of lymph nodes. *Ann Thorac Surg*. 2010;90(6):1773-7. doi:10.1016/j.athoracsur.2010.07.039
3. Tsai M.-S., Ko P. C.-I., Shih J.-Y., et al. Cardiac involvement in malignancies. Case 1. Favorable outcome of a patient with cardiac invasion from non-small-cell lung carcinoma. Journal of Clinical Oncology. 2004;22(13):2740–2742. doi: 10.1200/jco.2004.08.104.
4. Stella F, Dell'Amore A, Caroli G, et al. Surgical results and long-term follow-up of T4 non-small cell lung cancer invading the left atrium or the intrapericardial base of the pulmonary veins. *Interact Cardiovasc Thorac Surg*. 2012;14(4):415-9. doi:10.1093/icvts/ivr160
5. Chuah K. L., Yap W. M., Loh H. L., Lim K. H., Tan H. W., Lim C. H. Intravenous extension of sarcomatoid carcinoma of the lung to the left atrium. Pathology. 2006;38(4):359–361. doi: 10.1080/00313020600820773.
6. Mehan VK, Deshpande J, Dalvi BV, et al. Direct extension of bronchogenic carcinoma through pulmonary veins into the left atrium mimicking left atrial myxoma. *Chest*. 1992;101(6):1722-3. doi:10.1378/chest.101.6.1722
7. Takahashi K, Furuse M, Hanaoka H, et al. Pulmonary vein and left atrial invasion by lung cancer: assessment by breath-hold gadolinium-enhanced three-dimensional MR angiography. *J Comput Assist Tomogr*. 2000;24(4):557-61. doi:10.1097/00004728-200007000-00008
8. Guha S, Mookerjee S, Karmakar RN, et al. Left atrial extension of lung malignancy with ECG changes resembling STEMI. *Indian Heart J*. 2010;62(1):81-3.
9. Shimizu J, Ikeda C, Arano Y, et al. Advanced lung cancer invading the left atrium, treated with pneumonectomy combined with left atrium

resection under cardiopulmonary bypass. *Ann Thorac Cardiovasc Surg*. 2010;16(4):286-90.
10. Ucak A, Inan K, Onan B, Temizkan V, Alp I, Yilmaz AT. Free-floating tumor thrombus in the left atrium associated with non-small cell lung cancer. *J Card Surg*. 2009;24(6):686-9. doi:10.1111/j.1540-8191.2009.00927.x
11. Chan V, Neumann D. Small cell lung carcinoma invading the pulmonary vein and left atrium as imaged by PET/CT. *Eur J Nucl Med Mol Imaging*. 2005;32(12):1493. doi:10.1007/s00259-005-1930-9
12. Funakoshi Y, Mukohara T, Kataoka T, et al. Left atrial extension of metastatic lung tumor via pulmonary vein: report on the first case of Ewing sarcoma. *Rare Tumors*. 2010;2(3):e53. doi:10.4081/rt.2010.e53
13. Woodring JH, Bognar B, Van Wyk CS. Metastatic chondrosarcoma to the lung with extension into the left atrium via invasion of the pulmonary veins: presentation as embolic cerebral infarction. *Clin Imaging*. 2002;26(5):338-41. doi:10.1016/s0899-7071(02)00445-x
14. Jadoon MA, Sidhu P. Advanced right lung adenocarcinoma invading left atrium and left ventricle via right superior pulmonary vein and partially occluding mitral valve in diastole. *Eur J Echocardiogr*. 2011;12(6):420. doi:10.1093/ejechocard/jer050
15. Desai MY, Mankad S. Extension of bronchogenic carcinoma through pulmonary vein into the left atrium detected by echocardiography. *Echocardiography*. 2004;21(2):189-91. doi:10.1111/j.0742-2822.2004.02178.x
16. Koh TW. Invasion of lung mesenchymal chondrosarcoma into the left atrium via the pulmonary vein detected on transoesophageal echocardiography. *Eur J Echocardiogr*. 2011;12(7):556. doi:10.1093/ejechocard/jer068
17. Pitman AG, Solomon B, Padmanabhan R, McKenzie AF, Hicks RJ. Intravenous extension of lung carcinoma to the left atrium: demonstration by positron emission tomography with CT correlation. *Br J Radiol*. 2000;73(866):206-8. doi:10.1259/bjr.73.866.10884736
18. Watanabe N, Kubo K. Images in cardiology: intra-left atrial invasive mass extended via the pulmonary vein. *Heart*. 2001;85(3):271. doi:10.1136/heart.85.3.271
19. Ballo P, Laureano R, Briganti M, Passaleva MT, Piani F, Piga C, et al. Left atrial mass invasion from pulmonary neoplasm extension via the right upper pulmonary vein presenting as ipsilateral stroke. *J Stroke Cerebrovasc Dis*. 2010;19(5):398-400. doi:10.1016/j.jstrokecerebrovasdis.2009.05.007
20. Liaw CC, Chang H, Yang TS, Wen MS. Pulmonary venous obstruction in cancer patients. *J Oncol*. 2015;2015:210916. doi:10.1155/2015/210916
21. Gowda RM, Khan IA, Mehta NJ, et al. Cardiac tamponade and superior vena cava syndrome in lung cancer: a case report. *Angiology*. 2004;55(6):691-5. doi:10.1177/000331970405500611
22. Kinoshita K, Hanibuchi M, Kishi M, Kanematsu T, Nishioka Y, Sone S. Case of squamous cell lung cancer with myocardial metastasis complicated with ventricular tachycardia. *J Jpn Respir Soc*. 2009;47(9):817-22.
23. Morio S, Hara Y, Yamaga T, Yoshino Y, Nakamoto S, Sugiyoma N. A case report of complete heart block by metastatic cardiac involvement from lung cancer. *Jpn J Thorac Surg*. 1989;42(11):944-7.
24. Brandt RR, Rubin J, Reeder GS. Intracardiac extension of a lung tumor causing left ventricular inflow obstruction. *J Am Soc Echocardiogr*. 1995;8(6):930-3. doi:10.1016/S0894-7317(05)80019-7
25. Kinjo Y, Nagasaki A, Teruya I, et al. Cardiac involvement of lung cancer presenting with acute myocardial infarction-like electrocardiographic changes. *Intern Med*. 2006;45(2):113-4. doi:10.2169/internalmedicine.45.1559
26. Goto T, Maeshima A, Kato R. Lung adenocarcinoma with peculiar growth to the pulmonary artery and thrombus formation: report of a case. *World J Surg Oncol*. 2012;10:16. doi:10.1186/1477-7819-10-16
27. Shen Y, Zheng Y, Liu Z, Liang R, Yan Y, Long H, et al. Lung squamous cell carcinoma with metastases in the left atrium and left ventricle responds to treatment with immunotherapy: a case report. *Oncol Lett*. 2024;80. doi:10.3892/ol.2024.14826

Cite This Article: Sotondovo Sena Jeanine Emerite, Amchaarou Hanaa, Feniche Noura, Eyene Eyene Lambert Florent, El Minaoui Mohamed, Martynov Alesey Yu. (2026). Left Atrial Invasion of Lung Carcinoma: A Case Report. *East African Scholars J Med Sci, 9*(5), 292-296.