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CASE REPORT

# Endobronchial tumor, diagnosis and clinical and imaging evolution. A case report

## Tumor endobronquial, diagnóstico y evolución clínico imagenológica. A propósito de un caso

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**ABSTRACT**

Introduction: Lung cancer has been known since the 19th century, and to date has experienced multiple advances in diagnosis and treatment, which imply a favorable prognosis for the patient. However, worldwide it exhibits high morbidity and mortality rates, it occurs mainly in males, with an average age of 65 years, is closely related to smoking and is notable for its low survival rates, particularly when diagnosed in advanced stages, as often occurs in endobronchial presentation. Objective: To describe the diagnosis and clinical imaging evolution of a patient with an endobronchial tumor. Case presentation: A 56-year-old male patient, a smoker and a carpenter by profession, who began to present chest pain and a dry, irritating cough and went to the family doctor. A series of complementary tests were prescribed, which yielded pathological results, including a chest X-ray, which supported the initial diagnosis, and a computed axial tomography (CT) scan, which confirmed the presence of an endobronchial tumor. Oncological staging and follow-up were performed, and despite complications that arose due to the patient's withdrawal from the consultation, the patient progressed well. Conclusions: Early diagnosis of lung cancer based on clinical methods and imaging studies is essential. This can improve survival and reduce the physical, emotional, and social impact on the patient and their family, as demonstrated in our clinical case. A multidisciplinary approach is essential, combining technology, clinical knowledge, and human sensitivity to provide comprehensive care and improve the patient's quality of life.

Keywords: Lung cancer; endobronchial tumor; biopsychosocial damage; computed axial tomography (CT) scan.

**RESUMEN**

Introducción: el cáncer de pulmón se conoce desde el siglo XIX, y hasta la actualidad ha experimentado múltiples avances en cuanto a diagnóstico y tratamiento, que implican pronóstico favorable para el paciente. No obstante, a nivel mundial exhibe altas cifras de morbi-mortalidad, se presenta fundamentalmente en el sexo masculino, como edad promedio a los 65 años, tiene una estrecha relación con el tabaquismo y se destaca por las bajas cifras de supervivencia, de manera particular cuando se diagnostica en estadios avanzados, como suele ocurrir en la presentación endobronquial. Objetivo: describir el diagnóstico y evolución clínico imagenológica de un paciente con tumor endobronquial. Presentación de caso: paciente masculino, de 56 años de edad, fumador y carpintero de profesión, que comenzó a presentar dolor torácico y tos seca irritativa por lo que acudió al médico de familia; se le indicaron una serie de complementarios que arrojaron resultados patológicos, entre ellos la radiografía de tórax que favoreció el diagnóstico inicial y la tomografía axial computarizada que confirmó la presencia de un tumor endobronquial. Se realizó estadiamiento y seguimiento oncológico y a pesar de complicaciones que aparecieron por abandono de la consulta el paciente tuvo buena evolución. Conclusiones: Se hace imprescindible el diagnóstico precoz del cáncer de pulmón basado en el método clínico y los estudios imagenológicos lo cual puede mejorar la supervivencia y reducir el impacto físico, emocional y social en el paciente y su entorno como se evidenció en nuestro caso clínico. El abordaje multidisciplinario es fundamental, combinando tecnología, conocimiento clínico y sensibilidad humana para brindar una atención integral y mejorar la calidad de vida del paciente.

Palabras clave: Cáncer de pulmón; tumor endobronquial; daño biopsicosocial; tomografía axial computarizada.

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## INTRODUCTION

Cancer develops through a complex process of somatic evolution characterized by multiple genomic aberrations and the changing influence of mutational processes. Recent scientific studies suggest that alterations in driver genes often precede the diagnosis of cancer not just in years but also in decades.(1)Cancer is a health problem with high incidence and mortality. It is caused by the uncontrolled proliferation and growth of a group of cells, which can invade locally and distantly into other tissues. Lung cancer (PC) or bronchogenic carcinoma encompasses a group of diseases resulting from the malignant growth of cells in the respiratory tract, particularly in lung tissue.(2)

Lung cancer has changed over the last century; it was a poorly recognized pathology before the 20th century. Until 1900, only about 140 cases were known in the medical literature, and the disease was misdiagnosed as consumption (tuberculosis), pneumonia, or coal disease. However, the finding of lung tumors in autopsy sequences increased progressively in Germany in the second half of the 19th century and even more so in the first decade of the 20th century. Isaac Adler summarised this evidence in 1912 in the first monograph on lung cancer and pointed out that the incidence of malignant lung neoplasms appeared to show a decided increase.(3)

Lung cancer is the most common malignancy and the most frequent cause of cancer death in the world. In 2022, approximately 2,2 million new diagnoses were made. As a result of its high mortality rate (83 %), its lethality closely follows incidence, representing a public health problem. In Latin America, PC kills more people than any other neoplasm. According to the International Agency for Research on Cancer, in 2022, more than 80,000 people died from PC in the region, representing 30 000 lives lost and approximately 14 % of all deaths from the disease.(1)By 2024, estimates by the American Cancer Society in the United States are that about 234 580 new cases of lung cancer will be diagnosed (116 310 men and 118 270 women), about 125 070 people will die from lung cancer (65 790 men and 59 280 women).(4)The data presented above are the motivation for this article, which aims to describe the diagnosis and clinical imaging evolution of a patient with an endobronchial tumor, as the authors believe that lung cancer, due to its high incidence at present and its biopsychosocial repercussions, should be systematized from all aspects of public health. The presentation of this case shows the relevance of different imaging modalities in the diagnosis and follow-up of this condition and its complications.

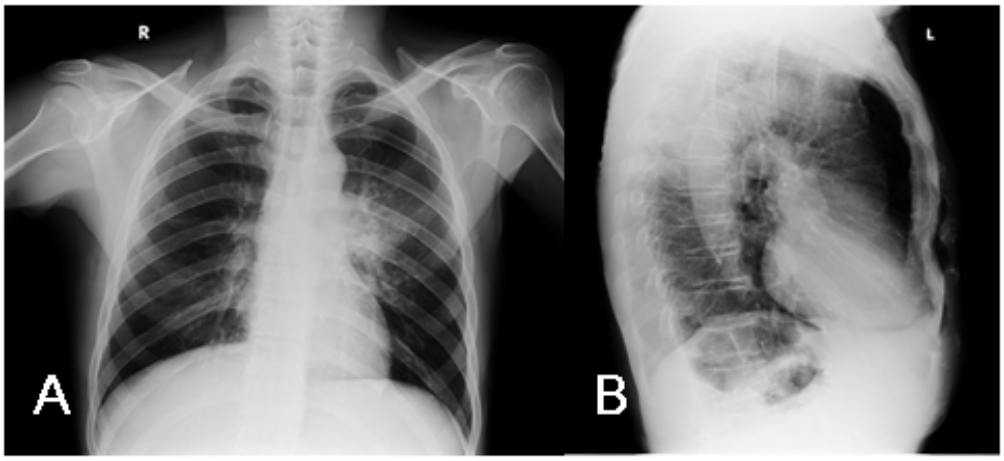
## CLINICAL CASE

A 56-year-old male patient, carpenter by profession, inveterate smoker, with a personal pathological history (PPP) of chronic arterial hypertension (AHT), for which he is receiving regular treatment and an allergy to iodine. He came to the family doctor's office because he had pain on the left side of his chest and a persistent dry cough that even made it difficult for him to sleep. Physical examination revealed hypo-colored and moist mucous membranes; respiratory system: decreased vesicular murmur in the middle third of the left lung field where subcrepitant rales were heard—no other data of interest. The doctor ordered a series of laboratory tests.

- Haemoglobin (Hb): 102 g/l, erythrocyte sedimentation rate: 145 mm/h.
- Abdominal ultrasound reports no visceral alterations, ascites, adenomegaly, or image in the pseudorenum. Ultrasound of lymph node chains: no cervical, axillary, or inguinal adenomegaly.

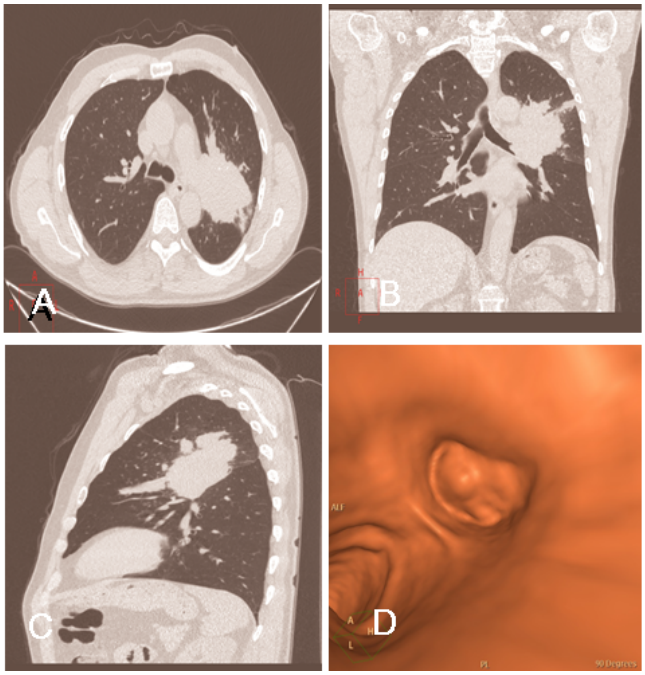
Postero-anterior chest X-ray (PA): no pleuropulmonary alterations in the right lung field. No pleural effusion. Normal cardiothoracic index. No mediastinal widening. There are no bony alterations, neither the soft tissues nor the visualized portions of the upper hemiabdomen. The left lateral view shows a radiopaque image in the pulmonary hilum (figure 1A-1B).

**Figure 1. A: chest X-ray (PA). B: left lateral chest X-ray. The left hilar region projection shows a poorly defined radiopaque image with spiculated contours causing hilar thickening, measuring approximately 27x43 mm and obliterating the vascular structures at that level**



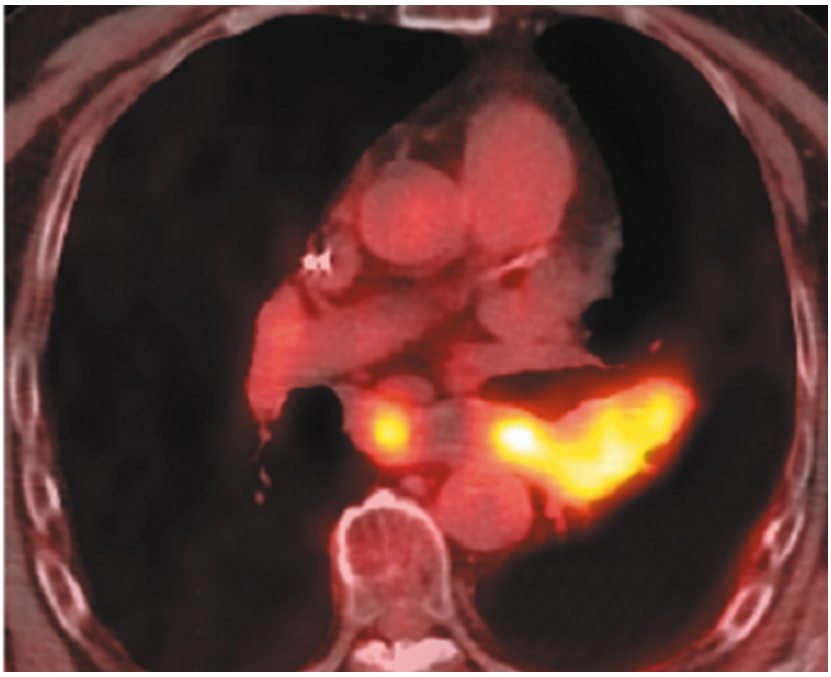

The imaging department proposed a diagnosis of left lung tumour in the hilar form and suggested a simple abdominal CT scan to better define the lesion and perform staging (figure 2A-2B).

**Figure 2. A: axial section image of chest CT at the level of the carina, lung parenchyma window. B: coronal reconstruction, lung parenchyma window. C: sagittal reconstruction, lung parenchyma window. D: endoscopic reconstruction.**




Chest CT views show a large hyperdense mass 2,5 cm from the carina at the level of the left hilum, with a homogeneous texture, pleural contact, and endobronchial growth. The endoscopic reconstruction showed an irregular mass in the left bronchiotruncus, which protruded and stenosed the organ's lumen. The patient was referred to the oncology department for positron emission tomography (PET/CT) (figure 3).

**Figure 3. PET/CT scan of the chest. It shows intense contrast uptake at the level of the tumour lesion and also in a subcarinal adenomegaly**



A multidisciplinary assessment is carried out and surgical treatment is decided.

## DISCUSSION

Lung cancer is currently one of the most critical health problems due to its high incidence, mortality, and marked biological, psychological, and social consequences. It is a fatal disease if diagnosed in advanced clinical stages. Unfortunately, due to the varied and non-specific symptoms of this type of cancer in its early stage, by the time people see a doctor, it is usually at stage IIIB or IV, which means a poor 5-year survival.(5)It occurs mainly in older people. Most people diagnosed are 65 years of age or older. The median age at diagnosis is approximately 70 years.(4)

The leading cause of lung cancer is smoking, and there is a direct link of up to 90 % in men and 85 % in women.(5)Age and sex-specific changes in mortality are presumed in the coming decades, given the relationship of smoking to the development of this neoplasm.(6)It is a heterogeneous disease with numerous clinical variables determining prognosis and survival. Most present clinical manifestations are in advanced stages of the disease, so treatment is mainly palliative, and only 10-25 % have the opportunity for surgical intervention with curative intent.(7,8)Early lung cancer rarely shows symptoms; during these stages, 80 % of patients present with general and non-specific symptoms such as asthenia, hypoxia, and weight loss. By the time the patient comes for a consultation, it is in advanced stages; the reasons for consultation are usually cough, dyspnoea, dysphonia, hemoptysis, and chest pain; occasionally, however, specific presentations such as superior vena cava occlusive syndrome, Pancoast syndrome, or Claude-Bernard-Horner syndrome can be found. Knowledge of the genesis of lung cancer is of vital importance, given its high prevalence and mortality. To make an early diagnosis, numerous efforts are devoted to the search for genomic variants and DNA variations that initiate the tumor process; however, these efforts have not been sufficient.(9)

In the last decade, significant diagnostic and therapeutic advances have improved prognosis, especially in specific subgroups of patients. Progress has been made in diagnostic accuracy thanks to new technologies, so an adequate radiological diagnosis is an essential tool in the care of lung cancer patients. In this sense, High-Resolution Computed Tomography (HRCT) has become a crucial tool, as it can demonstrate the presence of lung disease in cases with clinical suspicion and standard radiography. Based on the information obtained with this powerful tool, the radiologist can establish a diagnosis and stage of lung cancer.(10)

MRI is superior to CT for diagnosing lesions adjacent to the chest wall and upper sulcus and for mediastinal lymph node evaluation. Scintigraphy is a sensitive method in the detection of bone metastases. In contrast to conventional radiographic imaging, which provides anatomical information, scintigraphy provides functional information and is thus able to detect abnormalities that have not yet undergone morphological alteration. Bronchoscopic and transesophageal ultrasonography can assess the presence of mediastinal lymph nodes and whether there is extranodal invasion; it can also identify hilar lymph nodes and pulmonary nodules adjacent to the bronchi. Positron emission tomography with fusion to computed tomography provides additional value to the sum of both techniques separately.(5)In central tumors, bronchoscopy is the technique of choice (90 % yield).(11)According to Osejo Betancourt (12) and other authors, pure endobronchial tumors are rare entities with diverse characteristics that challenge their diagnosis and therapeutic approach, making diagnosis difficult until they are in advanced stages. They represent only 0,6 % of lung neoplasms, with more frequent primary malignancies. They should be suspected when there is no improvement in respiratory symptoms or adequate response to bronchodilators.

They generally present non-specific and variable symptoms, with cough, dyspnoea, hemoptysis, localized wheezing, recurrent pneumonia, or atelectasis due to bronchial obstruction. They may also be asymptomatic, mimic other neoplasms, or cause symptoms similar to chronic obstructive pulmonary disease (COPD) or asthma. When the tumor is specifically in the middle lobe bronchus, it can cause middle lobe syndrome, which is characterized by asymptomatic atelectasis and is usually diagnosed incidentally or associated with the development of post-obstructive pneumonia, also known as lipoid pneumonia.(12)

Chest radiography may be standard or show nonspecific findings such as solitary nodules, atelectasis, or consolidation. Chest computed tomography (CT) is the study of choice, as it allows better visualization of lesions, assesses the extent of the tumor, and allows differential diagnoses to be explored. The main tomographic findings correspond to bronchial or tracheal mass, distal bronchial dilatation, mucus impaction, segmental atelectasis, post obstructive pneumonia, or air trapping, and allow parenchymal or mediastinal lesions to be observed. When bronchial lesions are identified, the differential diagnosis is related to secretions obstructing the lumen; rounded, lobulated lesions with poorly defined margins and with more than 21,7 Hounsfield units strongly suggest an actual tumor.(12)Other less frequently performed studies include magnetic resonance or positron emission tomography. However, the former can be helpful in the study of adenoid cystic carcinoma or fatty attenuated lesions such as hamartomas and lipomas. At the same time, positron emission tomography (PET) allows the identification of 18-Flurodeoxyglucose (FDG) uptake, which suggests malignant etiology when it is increased.(12)The study of choice is flexible bronchoscopy, which allows histopathological studies to be obtained. Endobronchial ultrasound (EBUS) can be helpful in the study of the extension of lesions and their relationship with mediastinal structures. (12)Endobronchial tumors are rare entities; their diagnosis is challenging given the non-specific findings, presenting with a variable clinical presentation that depends on the degree of obstruction, both in benign and malignant tumors, which is why a multidisciplinary approach is required for an adequate diagnosis and treatment (12) based on the premise that the optimal use of technological resources contributes to improving the quality of life of patients.(13)

## CONCLUSIONS

Early lung cancer diagnosis based on the clinical method and imaging studies is essential. It can improve survival and reduce the physical, emotional, and social impact on the patient and their environment, as evidenced in our clinical case. Smoking remains the leading cause. Therefore, smoking prevention should be a public health priority. Modern imaging tools like PET/CT have revolutionized diagnosis, allowing for better staging and therapeutic planning. Endobronchial tumors are rare and difficult to diagnose, so a high index of clinical suspicion is required, especially in persistent respiratory symptoms. A multidisciplinary approach is essential, combining technology, clinical knowledge, and human sensitivity to provide comprehensive care and improve the patient's quality of life.

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