RGCS REVISTA GREGORIANA DE CIENCIAS DE LA SALUD

ISSN 3028-8940

JULY-DECEMBER 2025;2(2):16-25

CASE STUDY

https://doi.org/10.36097/rgcs.v2i2.3185

Small cell lung carcinoma: case study

Carcinoma microcítico de pulmón: estudio de caso

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Reception: 06-05-2025 *Acceptance:* 03-07-2025 *Publication:* 31-07-2025

ABSTRACT

Small cell lung carcinoma is a malignant neuroendocrine neoplasm characterized by rapid progression and high metastatic potential. This article presents the case of a 31-year-old male patient with no history of smoking who experienced persistent hemoptysis for one year, accompanied by asthenia and odynophagia. Imaging studies revealed a pulmonary mass located in the upper lobe of the left lung, involving the left main bronchus and accompanied by satellite nodular lesions, some of them cavitated. A CT-guided biopsy showed small, round-shaped cells with hyperchromatic nuclei and high mitotic activity. Immunohistochemical analysis revealed positivity for cytokeratin, TTF-1, CD56, and a moderate Ki-67 proliferation index, confirming the diagnosis of small cell lung carcinoma. This case is atypical due to the patient's young age, the peripheral location of the tumor, and the absence of classical risk factors such as smoking.

Keywords: small cell carcinoma, hemoptysis, immunohistochemistry, lung mass, case report.

RESUMEN

El carcinoma microcítico de pulmón es una neoplasia maligna de origen neuroendocrino, caracterizada por su rápida progresión y alto potencial metastásico. En este artículo se describe el caso de un paciente masculino de 31 años, sin antecedentes de tabaquismo, que presentó hemoptisis persistente durante un año, acompañada de astenia y odinofagia. Los estudios por imágenes revelaron una masa pulmonar localizada en el lóbulo superior izquierdo, con compromiso del bronquio principal izquierdo y lesiones nodulares satélites, algunas cavitadas. La biopsia guiada por tomografía computarizada mostró células pequeñas de morfología redondeada y nuclear hipercromática, con elevada actividad mitótica. El análisis inmunohistoquímico evidenció positividad para citokeratina, TTF-1, CD56 y un índice de proliferación Ki-67 moderado, lo que permitió confirmar el diagnóstico de carcinoma microcítico de pulmón. Este caso resulta atípico por la edad del paciente, la localización periférica del tumor y la ausencia de factores de riesgo clásicos, como el tabaquismo.

Palabras clave: carcinoma microcítico, hemoptisis, inmunohistoquímica, masa pulmonar, caso clínico.

Cite as: Bravo, R. V., Salazar, S., Carballosa, E., Cornejo, A. V., Palma, A. S., & Cedeño, K. E. (2025). Small cell lung carcinoma: case study. *Revista Gregoriana de Ciencias de la Salud*, *2*(2), 16-25. https://doi.org/10.36097/rgcs.v2i2.3185

INTRODUCTION

Currently, lung cancer is the most commonly diagnosed cancer worldwide and the leading cause of death. In 2018, 2.1 million new cases of lung cancer were diagnosed, and this type of cancer caused 1.8 million deaths. In the United States, lung cancer cases are estimated to be around 230,000, with a death toll of 150,000. It is most prevalent in adults aged 55-84 (Kumar et al., 2020).

Regarding the Latin American region, the global trend of lung cancer continues with an incidence of cases preferentially in the male sex, the figure being 16.8 cases per 100 thousand inhabitants. In contrast, compared to the female sex, the figures are 10.2 cases per 100 thousand inhabitants, with adults over 65 years of age with a history of smoking and exposure to carcinogenic substances being the most affected age group (Marquina et al., 2023).

From a histological perspective, the World Health Organization (WHO) categorizes lung cancer into various subtypes based on histological characteristics, including squamous cell carcinoma and its variants, adenocarcinoma, large cell carcinoma, adenosquamous carcinoma, sarcomatoid carcinoma, carcinoid tumor, and small cell carcinoma (SCLC) (Theran et al., 2024).

Microcytic lung carcinoma, also known as SCLC, is a type of malignant neuroendocrine lung cancer with a high capacity for lymphatic-hematogenous metastasis. It is characterized by containing granules in its cells, with which it secretes peptide hormones such as L-DOPA decarboxylase and neurospecific enolase. SCLC, in most cases, presents centrally in the lung, accompanied by mediastinal lymphadenopathy. Pathological studies describe the cells of SCLC as having a small, round, or oval shape, with abundant mitoses, necrosis, scant cytoplasm, and a hyperchromatic nucleus that gives it a lymphocytic appearance. Clinically, symptoms manifest in advanced stages of cancer, with cough being the most frequent symptom, accompanied by dyspnea, pleural effusion, hemoptysis, fever secondary to obstructive pneumonitis, and chest pain (Agustí et al., 2020).

In this context, the present study analyzed the case of a 31-year-old male patient with no history of smoking, who presented with persistent hemoptysis for one year, accompanied by asthenia and odynophagia. This case stood out due to its atypical nature, as the patient did not exhibit the classical associated risk factors, such as smoking, and the peripheral location of the

tumor was uncommon for his age group, posing an interesting diagnostic challenge.

CLINICAL CASE DESCRIPTION

A 31-year-old male patient presented to the emergency room on July 2, 2024. His family history included high blood pressure on his mother's side. His medical history includes third molar extraction surgery. The patient is up to date on his COVID vaccinations, having received four doses. He has no history of allergies, nor has he received chemotherapy or radiation therapy, and he does not exhibit toxic habits associated with smoking.

The reason for your current consultation is a clinical picture that has persisted for the last year, with hemoptysis that began in May 2023. At that time, you went to the Ecuadorian Social Security Institute (IESS) hospital in Santo Domingo, where a pharyngeal swab culture was performed due to oropharyngeal discomfort. The culture confirmed the presence of *Streptococcus pneumoniae viridans*, while the tuberculosis test was negative.

Due to the persistence of her symptoms, the patient consulted a private physician, who performed an X-ray and CT scan. These studies revealed a mass at the apex of the left lung. The patient's condition worsened, presenting moderate hemoptysis, asthenia, and odynophagia, leading to his admission to the IESS Portoviejo Hospital on June 30, 2024. Given the suspicion of a pulmonary mass, he was referred to a tertiary center for further specialized evaluation and management.

On physical examination, the patient's skull appears normocephalic, and the neck is free of lymphadenopathy. The chest is symmetrical and expansile, with clear, ventilated lung fields and normal heart sounds. The abdomen is soft, depressible, and nontender, with slightly decreased bowel sounds. The extremities are free of edema.

Vital signs are as follows: blood pressure of 126/78 mmHg, heart rate of 94 beats per minute, oxygen saturation (SpO_2) of 97%, and temperature of 37.5 °C. Among the altered laboratory results, the following findings are observed: high ultrasensitive C-reactive protein (CRP) at 4.72 mg/dL, high lactate dehydrogenase (LDH) at 339 U/L, ionic calcium levels reduced to 1.18 mmol/L, total calcium decreased to 8.4 mg/dL, and hemoglobin and hematocrit also decreased to 12 g/dL and 35%, respectively.

A computed tomography (CT)-guided biopsy with intravenous contrast was performed. The study, performed through the pulmonary and mediastinal windows, included axial sections from the thoracic apex to the adrenal glands. The image revealed a large condensation lesion in the left upper lobe of the lung, extending from the hilum to the chest wall. In addition, peripheral nodules were identified, the largest measuring 18 mm. No pleural effusion was observed (Figure 1).

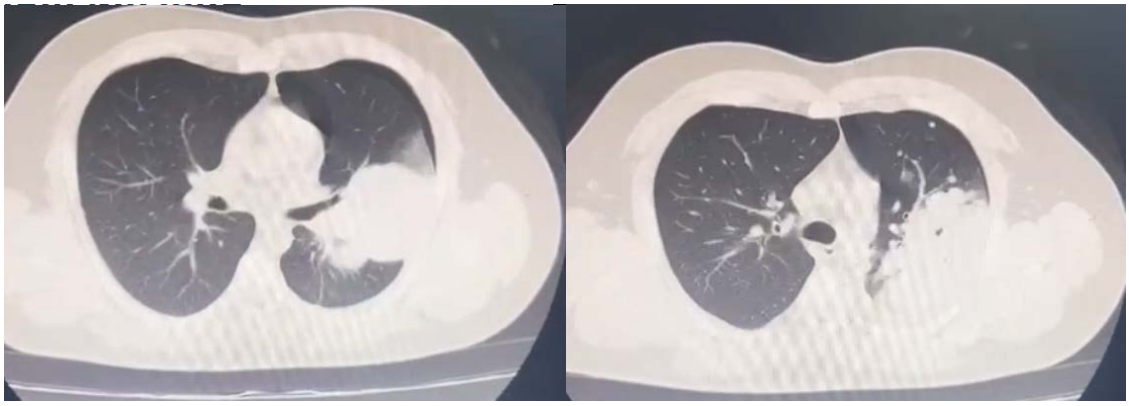

Figure 1. Computed axial tomography of the chest with intravenous contrast in the pulmonary and mediastinal window.

Plain chest CT scan reveals a space-occupying lesion with neoplastic characteristics. The lesion exhibits soft tissue densities ranging from 22 to 46 Hounsfield units (HU), characterized by lobulated borders and a heterogeneous structure. It presents central areas of lower density suggestive of necrosis. Its size is approximately 100 mm in the anteroposterior axis, 78 mm in the transverse axis, and 74 mm in length. The lesion encompasses the left main bronchus and is associated with similar nodular lesions, ranging in size from 5 to 20 mm, one of which is cavitated.

The pulmonary window reveals ground-glass density peripheral to the mass described, as well as a mild pleural effusion on the left side and a moderate pneumothorax on the same side. A 5-mm left para-aortic lymph node image is also observed, and no bone lesions are identified.

Additional imaging studies, including computed tomography (CT) of the neck with contrast, CT of the abdomen with contrast, CT of the pelvis with contrast, and CT of the head, both plain and with contrast, show no pathological changes.

The biopsy reveals sheets of rounded and spindle-shaped cells with scant cytoplasm. The cells are medium to small in size and have finely dispersed chromatin. Mitosis and apoptotic cells are observed, as well as the Azopardi phenomenon in the blood vessels (Figure 2).

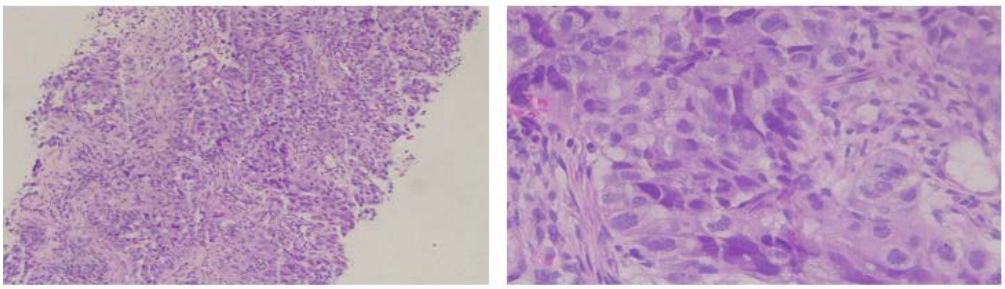

Figure 2. Hematoxylin-eosin (H/E).

Immunohistochemistry (IHC) revealed positivity for cytokeratin, TTF-1, and CD56, with a moderate Ki-67 proliferation index. The positivity in immunohistochemistry for TTF-1, CD56, and CD117 was consistent with SCLC in the cylinders examined (Figure 3).

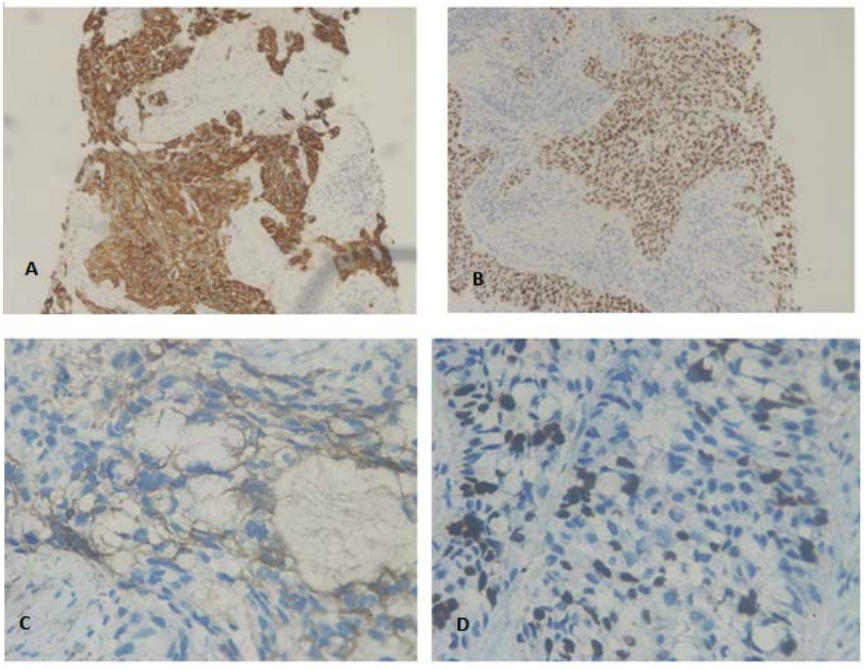

Figure 3. Immunohistochemical studies with positivity for cytokeratin (A), TTF1 (B), CD56 (C), and Ki-67 (D).

The positivity for the cytokeratin markers, TTF1, CD56, CD117, and Ki-67 of the results given by the immunohistochemical studies performed, highlighting the positivity of the neuroendocrine markers CD56 and CD117, together with the histopathological results of the samples obtained from the biopsy, are key results that guide a definitive diagnosis for SCLC.

DISCUSSION

SCLC and its pathological features were first recognized by Barnard in 1926. A few years later, Watson and Berg described clinical elements of the disease and noted its predominant central location on chest x-rays, as well as its early dissemination, its high frequency of metastasis, and its favorable prognosis for chemotherapy treatment.

Neuroendocrine lung tumors share ultrastructural, immunohistochemical, and morphological features but differ from other lung neoplasms, thus constituting a separate group in the WHO classification of lung neoplasms. These lung endocrine neoplasms are further classified as: 1. Typical carcinoid tumor; 2. Atypical carcinoid tumor; 3. Large cell neuroendocrine carcinoma; and 4. Small cell neuroendocrine carcinoma.

According to the research of Padilla et al. (2010), small cell carcinoma has the highest incidence of pulmonary neuroendocrine neoplasms, accounting for 9.8% of all lung tumors, and is more common in the sixth and seventh decades of life. As highlighted by Angulo et al. (2024), older adults frequently face malnutrition-related challenges that compromise both physical and psychological well-being, a situation especially relevant in oncologic contexts. Oxidative stress plays a key role in cancer pathophysiology, including SCLC. A diet rich in antioxidants can help modulate the redox balance, as highlighted by Forbes-Hernández et al. (2020), potentially influencing disease progression and treatment response. According to Baetting et al. (2025), the characteristic symptoms of small cell carcinoma include cough, hemoptysis, chest pain, and dyspnea.

According to Padilla et al. (2010), the histopathological characteristics of SCLC include small, rounded, oval, or spindle-shaped cells with fine chromatin nuclei, inconspicuous nucleoli, and scant cytoplasm. Immunohistochemistry, due to its epithelial nature, usually reveals a wide range of cytokeratins with a perinuclear pattern, such as CD56 and TTF-1. The markers commonly used are chromogranin A and synaptophysin.

In the study by Cáceres and Vinageras (2016), it was found that SCLC was predominantly male (57.5%) and that the tumor was located in the right lung in 48.1 % of cases. Pleural effusion was also present in 16 cases, and lymph node metastasis in 15 cases.

Regarding this case, there is no history of smoking in the patient; imaging reveals a peripheral condensation lesion in the left upper lobe of the lung. It is important to highlight that, according to research by Martínez et al. (2016), CPCP is associated with tobacco use in 95% of cases and is centrally located.

Based on the case's clinical presentation, history, and imaging findings, various differential diagnoses were suggested, including sarcoidosis, pulmonary actinomycosis, and lung adenocarcinoma, which were ruled out by the investigation and biopsy results.

According to Amaral (2020), sarcoidosis is a multisystem, granulomatous disease (aggregate of mononuclear inflammatory cells) where the lung is the most affected organ in 90% of cases, and between 12 and 50% of cases are asymptomatic at the time of diagnosis.

Pulmonary actinomycosis is a rare disease characterized by chronic granulomatous features, caused by anaerobic filamentous bacteria of the genus *Actinomyces*, which normally inhabit the oropharynx. It has varied presentations and can simulate a tumor mass similar to bronchogenic carcinoma (Acevedo et al., 2020).

“Lung adenocarcinoma is usually located peripherally, it is the most common cancer in non-smokers, it is characterized by slow growth with the formation of smaller masses with a clinical presentation of cough, dyspnea, hemoptysis and a ground-glass pattern can be observed on CT” (Martín et al., 2011), symptoms that agree with the patient's clinical picture, however, the histopathological characteristics of adenocarcinoma differ in contrast to the results of the histopathological and immunohistochemical studies of the case, which are consistent with the morphological patterns of SCLC.

According to the research of Quintero et al. (2008), the preferred treatment for carcinoid tumors is surgical resection. The use of adjuvant chemotherapy is also proposed when it is an atypical carcinoid, and postoperative mediastinal radiotherapy when mediastinal involvement is found.

CONCLUSIONS

SCLC is a highly aggressive neoplasm with a marked potential for metastatic spread, requiring early diagnosis and specialized treatment. Although most cases are associated with smoking and are usually centrally located, in the patient presented here, the peripheral location and absence of a smoking history stand out as atypical aspects of the case. The definitive diagnosis is achieved through histological and immunohistochemical studies, which in this case confirmed the neuroendocrine nature of the tumor. Despite its rapid and complex evolution, a combination of treatments such as chemotherapy and surgery, remains the primary therapeutic option. However, due to the high recurrence rate and risk of metastasis, ongoing patient follow-up is crucial to improve the prognosis.

CONFLICTS OF INTEREST

The author declares that they have no conflicts of interest.

AUTHOR CONTRIBUTIONS

Conceptualization: Ritha V. Bravo, Sirced Salazar, and Elizabeth Carballosa. **Data curation:** Anthony V. Cornejo, Andrés S. Palma, and Kendry E. Cedeño. **Formal analysis:** Ritha V. Bravo, Sirced Salazar, and Elizabeth Carballosa. **Investigation:** Ritha V. Bravo, Sirced Salazar, Elizabeth Carballosa, Anthony V. Cornejo, Andrés S. Palma, and Kendry E. Cedeño. **Methodology:** Ritha V. Bravo, Sirced Salazar, and Elizabeth Carballosa. **Software:** Anthony V. Cornejo, Andrés S. Palma, and Kendry E. Cedeño. **Supervision:** Ritha V. Bravo, Sirced Salazar, and Elizabeth Carballosa. **Validation:** Ritha V. Bravo, Sirced Salazar, and Elizabeth Carballosa. **Visualization:** Anthony V. Cornejo, Andrés S. Palma, and Kendry E. Cedeño. **Writing – original draft:** Anthony V. Cornejo, Andrés S. Palma, and Kendry E. Cedeño. **Writing – review & editing:** Ritha V. Bravo, Sirced Salazar, Elizabeth Carballosa, Anthony V. Cornejo, Andrés S. Palma, and Kendry E. Cedeño.

REFERENCES

Acevedo, L., Báez, L., & Fandiño, Y. (2020). Actinomicosis pulmonar, una enfermedad escasa. *Revista Colombiana de Neumología*, *32*(2), 46-51. https://doi.org/10.30789/rcneumologia.v32.n2.2020.532

Agustí, C., Marrades, R. M., & Molins, L. (2020). Tumores broncopulmonares. En C. Rozman &

F. Cardellach (Eds.), *Farreras-Rozman. Medicina interna* (19.ª ed., cap. 86, pp. 737–738). Elsevier España. http://bit.ly/4okmLhE

Amaral, M. (2020). Sarcoidosis pulmonar: actualización y reporte de casos. *Revista Uruguaya de Medicina Interna*, *1*(3), 118-131. https://revistamedicinainterna.uy/index.php/smiu/article/view/91

Angulo, A. A., Rodríguez, D., & García, M. A. (2024). Estado nutricional y calidad de vida del adulto mayor: revisión sistemática. *Revista Gregoriana de Ciencias de la Salud*, *1*(2), 165-177. https://doi.org/10.36097/rgcs.v1i2.3149

Baetting, E., Molina-Centelles, M. F., Amr-Rey, A., Mancheño-Franch, N., & Muñoz-Núñez, C. (2025). Las células neuroendocrinas en el pulmón: Espectro de patologías y su valoración radiopatológica. *Radiología*, *67*(3), 357-364. https://doi.org/10.1016/j.rx.2024.04.005

Barrionuevo, C., & Dueñas, D. (2019). Clasificación actual del carcinoma de pulmón. Consideraciones histológicas inmunofenotípicas, moleculares y clínicas. *Horizonte Médico*, *19*(4),74-83. https://doi.org/10.24265/horizmed.2019.v19n4.11

Cáceres, H., & Vinageras, E. (2016). Comportamiento del cáncer de pulmón células pequeñas en el hospital "Hermanos Ameijeiras". *Revista Electrónica Dr. Zoilo E. Marinello Vidaurreta*, *41*(2), 630. https://revzoilomarinello.sld.cu/index.php/zmv/article/view/630

Forbes-Hernández, T. Y., Betancourt, G., Rodríguez, D., García, M. A. (2020). Capacidad antioxidante total de la dieta *vs*. balance redox. *QhaliKay*, *4*(1), 35-48. https://doi.org/10.33936/qkrcs.v4i1.2711

Kumar, V., Abbas, A. K., & Aster, J. C. (2022). Robbins y Cotran: Patología estructural y funcional (10th ed., ch. 15, pp. 715-752). Elsevier. https://www.inspectioncopy.elsevier.com/book/details/9788491139119

Marquina, F., Lévano, C., & Fuster, D. (2023). Nuevos avances terapéuticos en pacientes con cáncer de pulmón inmunosuprimidos con enfermedades crónicas pulmonares en el periodo 2014-2022 a partir de la revisión de la literatura. *Revista Española de Salud Pública*, *97*, e202302015. https://ojs.sanidad.gob.es/index.php/resp/article/view/95

Martín, I., Vidal, M. R., Blanco, R., Tabernero, R. D., Martín, M. A., & Sánchez, J. M. (2011). Adenocarcinoma pulmonar tipo bronquioalveolar no mucinoso. *Revista de Patología Respiratoria*, *14*(4), 150-152. https://www.elsevier.es/es-revista-revista-patologia-respiratoria-318-pdf-X1576989511589711

Martínez, F., Matos, L. E., Acosta, S. C., & Cobián, C. O. (2016). Características clínicas y evolutivas de pacientes con cáncer pulmonar de células pequeñas. *MEDISAN*, *20*(1), 42-48. http://scielo.sld.cu/pdf/san/v20n1/san07201.pdf

Padilla, Á. L., Alban, L. F., & Gerson, R. (2010). Tumores neuroendocrinos de pulmón. Estrategias de tratamiento en carcinoma de células pequeñas con enfermedad extensa. *Anales Médicos*, *55*(3), 154-160. https://www.medigraphic.com/pdfs/abc/bc-2010/bc103h.pdf

Quintero, J. L., Rojas, J. C., Sánchez, J., & Jaramillo, L. F. (2008). Tumores neuroendocrinos del pulmón. *Universitas Médica*, *49*(3), 413-423. https://www.redalyc.org/pdf/2310/231016421011.pdf

Theran, J. S., Arenas, C. E., Garzón, D., Vergara, M., Pabón, L. I., Acuña, F. L., Layton, J. N., & Mutis, D. (2024). Cáncer de pulmón revisión sobre los alcances e innovaciones en clasificación, manejo y terapéutico. *Ciencia Latina*, *8*(2), 4345-4360. https://doi.org/10.37811/cl_rcm.v8i2.10839