

## **Small Cell Lung Cancer with Metastasis to the Central Nervous System in Secondary Care. Case Report**

**Marcos García Aranda<sup>1</sup>, Estanislao Antonio Calixto<sup>1</sup>, Jessica Ariatna Carreto Navarrete<sup>3</sup>, Tania Dennise Gómez Mayorquín<sup>1</sup>, Alfredo Bautista de la Cruz<sup>1</sup>, Ana Gabriela Pérez Cruz<sup>2</sup>, Yunelly Paola Sarmiento Sosa<sup>1</sup>, Héctor García Aranda<sup>1</sup>, Josué Isaac Olarte García<sup>1</sup>**

<sup>1</sup>Department of Internal Medicine. High Specialty Hospital of Veracruz SSA-SESVER

<sup>2</sup>IMSS UMAE Specialty Hospital 14 National Medical Center "Adolfo Ruiz Cortines", Veracruz Mexico

<sup>3</sup>Oncology Department. IMSS 21st Century National Medical Center, Mexico

### **ABSTRACT**

Neuroendocrine tumors represent approximately 20% of lung cancers; most are small cell lung cancer. The WHO classification system is used to classify lung tumors. In cases where there are clinical manifestations, these will depend on the location, size and perilesional edema generated by the metastases. A 78-year-old male who presented sudden right hemiplegia and bradylalia. A simple tomography of the skull was performed where hyperdense lesions were identified in two different regions, with well-defined borders and perilesional edema, for which a simple chest tomography was performed where a left lung tumor was evidenced, through bronchoscopy bronchoalveolar lavage was performed, which reported small cells. with data suggestive of small cell carcinoma with metastasis to the central nervous system. Small cell lung cancer is the most aggressive form of lung cancer. Although characterized by rapid responses to chemotherapy and sensitivity to radiation therapy, due to early resistance to treatment, the 5-year overall survival is <10%. Clinical suspicion from the second level of care allows us to focus on a more effective diagnostic protocol.

**KEYWORDS:** small cell lung carcinoma, neoplasm metastasis, neuroendocrine tumors

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### **INTRODUCTION**

Neuroendocrine tumors represent approximately 20% of lung cancers; the majority (approximately 14%) are small cell lung cancer (SCLC)<sup>1</sup>. It is characterized by rapid growth with high potential for metastatic spread and resistance to treatment. Although the traditional staging of TMN lung cancer is prognostic, SCLC is classically divided into limited stage (LS) and extensive stage (ES) disease. Limited disease accounts for 25% of newly diagnosed cases and defines disease that can be treated in a single radiation field. Most patients, 75% to 80%, are categorized as extensive stage at the time of diagnosis<sup>2</sup>.

The WHO classification system is used to classify lung tumors. Lung cancers were mainly classified into two subtypes: small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC)<sup>1,3,4,5</sup>.

Most brain metastases occur by hematogenous dissemination, with contiguity invasion being less common.

It is interesting to observe that the distribution of brain metastases is proportional to the blood flow in the area in question, with 80% of the lesions located in the brain, 15% in the cerebellum, and 5% in the brain stem<sup>5</sup>.

The first step for hematogenous dissemination to occur is the invasion of the arterial wall at the level of the primary tumor, thus allowing some neoplastic cells to detach and enter the bloodstream. Then this cell must be able to adhere to the cerebral vasculature; this process depends on a series of mediators. Once attached to the vascular wall, neoplastic cells must cross the blood-brain barrier, which is composed of a non-fenestrated endothelium with tight junctions, which lines the microvasculature of the brain and limits the entry of macromolecules and cells. to the brain parenchyma. The blood-brain barrier and the absence of a lymphatic system provide the brain with significant protection against the entry of many drugs and microorganisms, but eventually it is not capable of preventing the entry of neoplastic cells<sup>5</sup>.

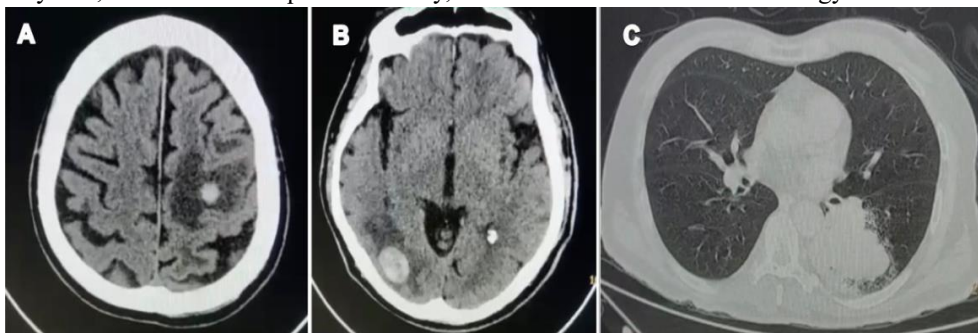
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In cases where there are clinical manifestations, these will depend on the location, size and perilesional edema generated by the metastases. Those of large size and edema generally manifest with headache as the main symptom, due to intracranial hypertension that occurs. Something similar occurs in cases where the metastasis obstructs the flow of cerebrospinal fluid, with the consequent associated hydrocephalus. In the case of metastases located close to the cortex; seizures and ictal phenomena are frequent manifestations. When the tumor is in a specific functional area, it will give rise to its corresponding alterations: paresis, aphasia, diplopia, among others<sup>4,5</sup>. The case of a patient with metastatic neoplasia in the second level of care is presented.

### CLINICAL CASE

A 78-year-old male patient who suddenly presented right hemiplegia and bradyphasia, with no subsequent recovery,

during the episode showed blood pressure values of 210/110 mmHg. Therefore, it is referred to the second level of care where a simple skull tomography is performed (fig. 1A, B) where hyperdense lesions are identified in two different regions, with well-defined borders and perilesional edema, laboratory results with 129 mg sodium /dL, platelets 498,000, leukocytes 18.3, hemoglobin 12.9 mg/dL. Subsequently, treatment with dexamethasone 8 mg every 8 hours for 3 days was started, showing recovery of the neurological status, without improvement in the paresis of the right hemi body. Neurosurgery assesses anyone who suspects brain metastases, for which a simple chest tomography was performed (Fig. 1C) which revealed a left lung tumor, bronchoscopy performed bronchoalveolar lavage that reported small cells with data suggestive of small cell carcinoma with metastasis to the central nervous system, sent to third level with oncology service.



**Figure 1. A, B, C, Primary small cell lung tumor in the posterior and basal region with metastases in the left temporal and right occipital hemispheres.**

### DISCUSSION

Small cell lung cancer (SCLC) is the most aggressive form of lung cancer. Although SCLC is characterized by rapid responses to chemotherapy (ChT) and sensitivity to radiotherapy (RT), due to early resistance to treatment, the 5-year overall survival is <10%<sup>6</sup>.

Although clinical progress in the treatment of SCLC has been notoriously slow, a better understanding of the biology of the disease has uncovered new vulnerabilities that could be amenable to specific therapeutic approaches<sup>7</sup>. Approximately 60%-70% of patients present with metastatic disease at diagnosis, and the overall prognosis for this group remains poor. However, in patients with metastatic SCLC, curative intent chemotherapy with radiation therapy results in a 5-year survival rate of 10% to 15%<sup>8</sup>. A new, effective, and active combination for extensive stage SCLC would move quickly as a treatment priority<sup>9</sup>.

### CONCLUSIONS

Small cell lung cancer continues to be a frustrating disease to investigate and treat; more complex studies are required to respond to all the challenges that this type of neoplasia implies. Clinical suspicion from the second level of care allows us to focus on a more effective diagnostic protocol.

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