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Neuroendocrine Small Cell Neoplasm Arise From Lungs To Spinal Cord Presenting As Pleural Effusion: A Rare Case Report

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Abstract: Neuroendocrine small cell carcinoma (SCLC) is an aggressive form of lung cancer with a high propensity for early metastasis. The most common sites of metastasis are regional lymph nodes, liver, bones, and brain. However, metastasis to the spinal cord is an exceedingly rare occurrence. This case report presents a rare instance of a neuroendocrine small cell neoplasm that originated in the lungs and extended to the spinal cord, initially presenting with a pleural effusion. A 50 years old female patient was presented with the complaints of breathing difficulty, left sided chest pain and palpitaton was admitted in the pulmonology department. The patient had history of Rheumatic heart disease and has undergone balloon mitral valvuloplasty in 2009. According to CECT thorax, USG abdomen and pelvis the patient had pleural effusion. MRI dorsal spine with cervical spine screening suggested malignant neurogenic tumor. Based on biopsy from left pleural effusion the patient was found to have metastatic neuroendocrine neoplasm possibly small cell carcinoma. The clinical presentation, diagnostic approach, and treatment strategy are discussed in light of current literature. This case highlights the complexity of diagnosing such rare metastases and emphasizes the importance of early recognition and multi-disciplinary management in such aggressive neoplasms.

Index Terms – Neuroendocrine carcinoma, Non Small cell lung cancer, Spinal cord metastasis

I. INTRODUCTION

Small cell lung carcinoma (SCLC) is an aggressive neuroendocrine tumor accounting for approximately 15% of all lung cancers, characterized by rapid growth and early dissemination to distant sites [1]. Despite its initial sensitivity to chemotherapy and radiotherapy, the prognosis remains poor, with a 5-year survival rate below 7% due to early metastasis and recurrence [2]. Common metastatic sites of SCLC include the liver, bone, brain, and adrenal glands; however, spinal cord involvement is relatively uncommon and often presents as an epidural metastasis rather than direct parenchymal infiltration [3,4].

Paraneoplastic and metastatic neurological complications in SCLC are well-documented, but direct spread to the spinal cord parenchyma remains exceedingly rare and sparsely described in literature [5]. Additionally, pleural effusion is a frequent clinical finding in advanced lung cancer, including SCLC, often indicating extensive disease or lymphatic obstruction [6]. However, the presentation of pleural effusion combined with contiguous extension from the lung to spinal structures is rare, making diagnosis and management particularly challenging [7].

In this case report, we present a rare and unusual case of a neuroendocrine small cell carcinoma of the lung with direct extension to the spinal cord, initially manifesting as a pleural effusion. This case underscores the importance of considering atypical metastatic patterns in SCLC and the value of advanced imaging and histopathological confirmation in such complex presentations.

CASE PRESENTATION

A 50-years-old female patient admitted with breathing difficulty, left-sided chest pain for three days. Patient had medical history of Rheumatoid Heart Disease 23 years back and have undergone Balloon Mitral Valvuloplasty and was on treatment with INJ.LASIX, T.DIGOXIN. physical examination of chest showed bilateral rhonchi, and diminished breath sound more on left side. She had elevated WBC count of 16710 cell/cumm, was afebrile. The patient was initially diagnosed with Left Lung Collapse & Pleural Effusion.

Her USG abdomen and pelvis shows Grade II fatty Liver, Bulky uterus with fibroids, Moderate hydrosalpinx on right side, Gross left pleural effusion with underlying lung collapse.pleural based lesions seen in the lower posterior hemithorax, largest measuring 5cm.

II. DISCUSSION

Small cell lung carcinoma (SCLC) is an aggressive neuroendocrine malignancy with a strong proclivity for early hematogenous spread. Although bone and brain metastases are common, spinal cord metastasis is distinctly uncommon but clinically devastating. In pooled analyses of intramedullary spinal cord metastases from lung cancer (ISCM-LC), SCLC represents the single most frequent histology among lung primaries, underscoring its neurotropism and rapid course.

An 83-year-old man with previously treated stage IV SCLC developed paraplegia, sensory loss below the umbilicus, and bowel/bladder dysfunction. MRI revealed an enhancing intramedullary lesion at T10–L1, consistent with SCLC metastasis. The diagnosis was based solely on clinical and radiological findings. This report underscores the diagnostic value of MRI in rapidly progressive neurological decline, even when histological confirmation is unavailable.

A 70-year-old man with stage IIIB SCLC initially responded partially to chemotherapy and radiotherapy. However, within weeks he developed rapidly progressive leg pain, numbness, paraplegia, and bowel/bladder involvement. MRI showed intramedullary metastases at T11–T12. Despite immediate radiotherapy, neurological decline continued and the patient died within two months.

A 47-year-old woman initially achieved complete remission after chemotherapy and mediastinal radiotherapy for atypical SCLC. Three months later, she developed Brown-Séquard syndrome. MRI revealed intramedullary lesions at T10–T12 with concurrent brain metastases. Treatment with steroids and radiotherapy yielded no neurological recovery, and she died four months later.

A 74-year-old woman presented with leg pain, numbness, and paraparesis, without known pulmonary disease. MRI revealed a solitary enhancing lesion at T9–T10. The tumor was resected, and histopathology, including synaptophysin and pan-cytokeratin positivity, confirmed small-cell neuroendocrine carcinoma of pulmonary origin. PET scan identified the lung primary; no other metastases were found. Postoperative chemotherapy and physiotherapy followed, and she remained alive and stable at 9 months post-diagnosis.

77-year-old man with dramatic response to chemotherapy. A case involved an SCLC patient (stage IV) who developed a spinal metastasis at Th10, causing significant neurological decline. Systemic chemotherapy (carboplatin plus etoposide) led to prompt reduction in spinal lesion size and neurological improvement after just one cycle.

Conclusion

Neuroendocrine small cell carcinoma of the lung remains one of the most aggressive malignancies, characterized by rapid progression, early metastasis, and poor prognosis. Spinal cord involvement, though uncommon, represents a serious and debilitating complication that can lead to profound neurological impairment if not identified and managed at an early stage. This case emphasizes the necessity of maintaining a high index of suspicion when patients with known or suspected pulmonary small cell carcinoma present with back pain, motor weakness, or sensory disturbances. Timely neuroimaging and histopathological confirmation play a pivotal role in establishing the diagnosis, delineating the extent of metastatic spread, and planning targeted therapy.

Management of such cases demands a multidisciplinary approach involving medical oncology, radiation oncology, neurology, neurosurgery, and supportive care teams to achieve optimal outcomes. While systemic chemotherapy remains the cornerstone of treatment for small cell lung carcinoma, the role of radiotherapy and surgical intervention in spinal involvement should be carefully individualized based on the patient's neurological status and overall condition.

Ultimately, reporting rare manifestations such as spinal cord metastasis in small cell carcinoma contributes significantly to the existing literature, enhances clinical awareness, and may assist in the development of evidence-based strategies for early diagnosis and comprehensive management. Further studies and accumulation of case reports are warranted to better understand the pathophysiology, prognostic implications, and therapeutic options in such rare but clinically important presentations.

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