

## Leptomeningeal carcinomatosis in a patient with lung cancer: A case report

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### Abstract

Leptomeningeal carcinomatosis known as neoplastic meningitis & cancer of meninges is the invasion of leptomeninges which includes the pia mater and arachnoid membrane. It is one of the rare complications of cancer and usually terminal. They are associated with breast cancer, melanoma, lung cancer, leukemia, lymphoma. Leptomeningeal carcinomatosis is seen only 5% of lung cancer patients. If left untreated median survival is 4-6weeks and if treated median survival is 3-4 months. Intrathecal therapy if used optimally along with targeted therapy when indicated result in good palliation with improvement in survival. In this report we present a case of 58 year male who is a chronic smoker who is diagnosed as having adenocarcinoma lung with leptomeningeal carcinomatosis which is a rare presentation.

**Keywords:** Leptomeningeal carcinomatosis, Neoplastic meningitis, Lung cancer.

### Introduction

Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body. In the recent years cancer has become one of the important burden in the NCDs. Cancer of lung is the leading in prevalence in male. Adenocarcinoma of lung is commonest of the lung cancer. They are seen in smokers and non-smokers. This cancer usually is seen peripherally in the lungs, as opposed to small cell lung cancer and squamous cell lung cancer, which both tend to be more centrally located, although it may also occur as central lesions. Complications associated with lung cancer are Shortness of breath, hemoptysis, Pain, pleural effusion, metastasis. Leptomeningeal carcinomatosis or Meningeal carcinomatosis is a condition in which a solid tumor diffusely spreads to the leptomeninges. Lung tumors, breast tumors, and malignant melanoma comprise the majority of solid tumors spreading to the leptomeninges.

### Case History

A 58 year chronic smoker was brought to the casualty with the H/O headache for 15 days, chronic cough, back pain and fever. The patient was symptomatically treated earlier but the symptoms didn't subside, when enquired in detail he gave the H/O loss of appetite, voice change, loss of weight and chest pain on and off, visual disturbances. Patient was admitted and the work up for diagnosis was started initially patient was initially treated with antibiotics, iv fluids, analgesics. First x-ray chest was taken which showed a mass lesion in the left lung and then the patient was planned for CT Thorax. CT Thorax showed an 3.2×3 cm sized mass in the left lower lobe superior segment and 11×4×11.2 cms sized lipoma involving the subcutaneous fat plane of left upper posterior chest wall

near the midline. In order to confirm the diagnosis of cancer CT guided biopsy was done and the report came as adenocarcinoma left lung lepidic type.

Patient was planned for left lobectomy, suddenly on the 4<sup>th</sup> day of admission the patient said complaints of diplopia, unsteadiness while walking and sensory disturbances and on examining he was of altered sensorium and involvement of cranial nerves was also present. Then the work up to rule out brain metastasis was started.

CECT brain was taken and it showed features suggestive of Leptomeningeal carcinomatosis. Being a rare complication of cancer the gold standard confirmatory test of CSF analysis was done. CSF analysis showed increase in opening pressure, increased protein concentration, reduced level of glucose and malignant cells.

**Table 1: CSF analysis values from lumbar puncture performed note the increase in total protein, IgG, opening pressure**

CSF Characteristics	Patient Value	Reference Value
Total Protein	>250 mg/dL	15-45 mg/dL
WBC Count	7 cells/uL (80% lymphocytes, 0% PMNs)	0-5 cells/uL
IgG	16.5 mg/dL	0-9.1 mg/dL
RPR	Negative	Negative
Lyme Antibody	Negative	Negative
Opening Pressure	450 mm H <sub>2</sub> O	<250 mm H <sub>2</sub> O
Glucose	35 mg/dL (serum=80)	>60% serum glucose
Cytology	Metastatic lung CA	N/A

As the patient was diagnosed as Leptomeningeal carcinomatosis which occurs in the terminal stage the

treatment plan must include radiotherapy, chemotherapy and surgery. After explaining the prognosis and treatment options the patients attenders didn't give consent for surgery and so only palliative chemotherapy was chosen. Intrathecal chemotherapy with cytarabine, methotrexate, thiotepa was started in order to clear the leptomeningeal deposits and tumor cells floating in the CSF to prevent further metastasis, supportive care with opioids and symptomatic treatment was given. After 2 cycles of chemotherapy patient showed some improvement in the CNS manifestations but not as to be happy.

## Discussion

Meninges are the membranes covering the brain and spinal cord. The term leptomeninges includes the arachnoid and pia mater and CSF is present in the sub arachnoid space. Leptomeningeal carcinomatosis is the spread of the tumor cells into the meninges and ventricles. It is seen rarely in cancer patients during the final stage. Most often leptomeningeal carcinomatosis presents in patients with cancer at the time when systemic disease has recurred or when prior chemotherapy regimens have failed. Thus, the goal of treatment for leptomeningeal carcinomatosis, if initiated, is often to control or preserve neurologic performance, while attempting to attenuate other widespread systemic disease and palliation. In patients with cancer lung leptomeningeal carcinomatosis is seen in 5% of them. They are also seen in patients with breast cancer, melanoma, gastric cancer, leukemia, lymphoma.

Meningeal symptoms are the first manifestations in some patients and are due to meningeal irritation, may include the following:

Headache along with nausea, vomiting & dizziness, Gait disturbances from weakness or ataxia, Memory loss, Sensory abnormalities, Incontinence.

CNS symptoms are divided into the following 3 anatomic groups:

1. Cerebral involvement: Headache, lethargy, papilledema, behavioral changes, and gait disturbance.
2. Cranial-nerve involvement: Impaired vision, diplopia, hearing loss, and sensory deficits, including vertigo; cranial-nerve palsies commonly involve CN III, IV, VI, VII, and VIII
3. Spinal-root involvement: Nuchal rigidity and neck and back pain, or invasion of the spinal roots.

Diagnosis is usually by positive CSF cytologic results, subarachnoid metastases identified on radiologic studies, or a history and physical examination suggestive of leptomeningeal carcinomatosis along with abnormal CSF findings. Of these CSF analysis by lumbar puncture remains the gold standard. Gadolinium-enhanced multi-planar MRI is the preferred imaging modality over CT because of its sensitivity and specificity. MRI findings considered diagnostic of leptomeningeal carcinomatosis include

leptomeningeal enhancement of the brain, spinal cord, cauda equina, or subependymal areas, which extend into the sulci of the cerebrum or folia of the cerebellum.

Leptomeningeal carcinomatosis is incurable and difficult to treat. Treatment goals include improvement or stabilization of the patient's neurologic status, prolongation of survival, and palliation. Most patients require a combined approach of surgery, radiation, and chemotherapy.

## Conclusion

The case was leptomeningeal carcinomatosis with adenocarcinoma left lung presented with neurological involvement. Being an incurable condition with poor prognosis the patient was put on palliative chemotherapy. Thus early suspicion on the patients with cancer and a thorough work up to rule out brain metastasis along with proper treatment may avoid the occurrence of leptomeningeal carcinomatosis.

## References

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