



Case Report

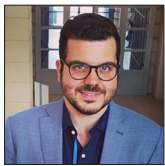
# Cauda equina syndrome caused by lumbar leptomeningeal metastases from lung adenocarcinoma mimicking a schwannoma

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## ABSTRACT

**Background:** Cauda equina syndromes (CESs) due to leptomeningeal metastases from primitive lung tumors are rare. Despite recent advancements in neuro-oncology and molecular biology, the prognosis for these patients remains poor. Here, we present a case in which a patient developed lumbar leptomeningeal metastases from lung carcinoma that contributed to a CES and reviewed the appropriate literature.

**Case Description:** A 55-year-old female presented with the left lower extremity sciatica/weakness. Two years ago, a then 53-year-old female had received Gamma Knife stereotactic radiosurgery (SRS) for a cerebellopontine angle schwannoma. Recently, she underwent resection of lung carcinoma and SRS for a right hemispheric cerebellar metastasis. Now at age 55, she presented with the left lower extremity sciatica/weakness. When her new lumbar MR was interpreted as showing a L5 schwannoma, a L4-L5 laminectomy was performed at surgery, the authors encountered multifocal leptomeningeal metastases densely infiltrating the cauda equina. Although only subtotal resection/decompression of tumor was feasible, she did well for the ensuing year. The histological diagnosis confirmed the lesion to be a poorly differentiated lung adenocarcinoma.

**Conclusion:** Patients with a history of prior metastatic lung cancer may present with spinal leptomeningeal metastases resulting in a CES.

**Keywords:** Metastases, Schwannoma, Leptomeningeal, Cauda equina, Lung cancer

## INTRODUCTION

Neoplasms that cause a cauda equina syndrome (CES) can be either primary or secondary lesions. The primary tumors include myxopapillary ependymomas, neurinomas, and more rarely, paragangliomas, astrocytomas, chordomas, and giant cell tumors. Secondary metastatic tumors, including leptomeningeal metastases, are typically attributed to the following primary cancers: lung, breast, renal, colon, and lymphoma.<sup>[4]</sup> Here we report a patient presenting with a CES due to multifocal L4-L5 leptomeningeal metastases from lung adenocarcinoma.

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## METHODS

Fourteen articles from PubMed, Scopus, and Google Scholar databases (Mesh terms: cauda equina AND metastases AND lung carcinoma OR spinal AND leptomeningeal AND metastases AND lung carcinoma) focused on lung leptomeningeal metastases resulting in CES.<sup>[1-3,5-7,9-16]</sup>

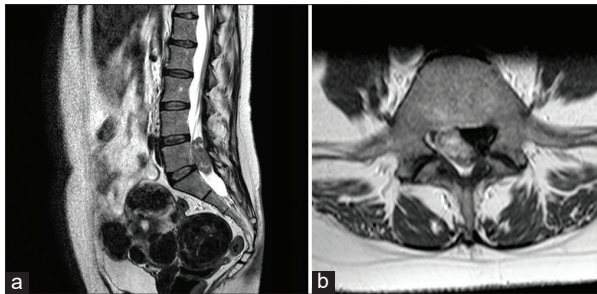
## CASE DESCRIPTION

### History

Two years ago, the patient had received Gamma Knife stereotactic radiosurgery (SRS) for a right cerebellopontine angle schwannoma. She recently had undergone resection of a lung adenocarcinoma and had received SRS for a right hemispheric cerebellar metastasis (e.g., infiltrating roof of the IV ventricle). She now presented at age 55 with the left lower extremity sciatica, and a partial CES characterized by a left L5-sided partial foot drop (4/5 level), left L5 sensory changes, and severe saddle hypoesthesia.

### MR study

The lumbosacral MR was interpreted as a schwannoma of the cauda equina at the L5 level; no additional lesions were found when MR was utilized to evaluate the rest of the neuraxis [Figure 1a and b].



**Figure 1:** Preoperative lumbosacral magnetic resonance imaging T2-weighted sagittal (a) and axial (b) images demonstrate a median-paramedian right mass at L5 level, occupying more than 50% of spinal canal.

## Surgery and histology

An L4-L5 laminectomy was performed, and only subtotal resection of tumor was feasible as multiple leptomeningeal metastases were densely adherent to/and infiltrated the multiple nerve roots of the cauda equina [Figure 2a-c]. Histologically, the lesion proved to be a poorly differentiated adenocarcinoma.

### Postoperative course

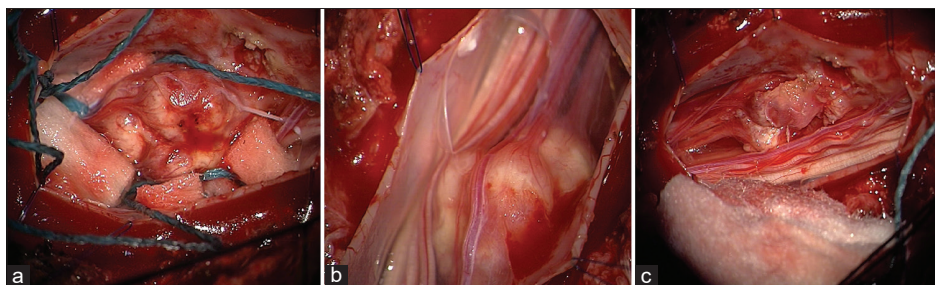
Postoperatively, her prior symptoms/signs improved, and she was discharged on adjuvant chemotherapy and radiotherapy. One-month later, the lumbosacral magnetic resonance imaging confirmed adequate spinal canal decompression at the L4-L5 level (e.g., subtotal removal) [Figure 3a-c]. Of interest, 1 year later, she exhibited no disease progression.

## DISCUSSION

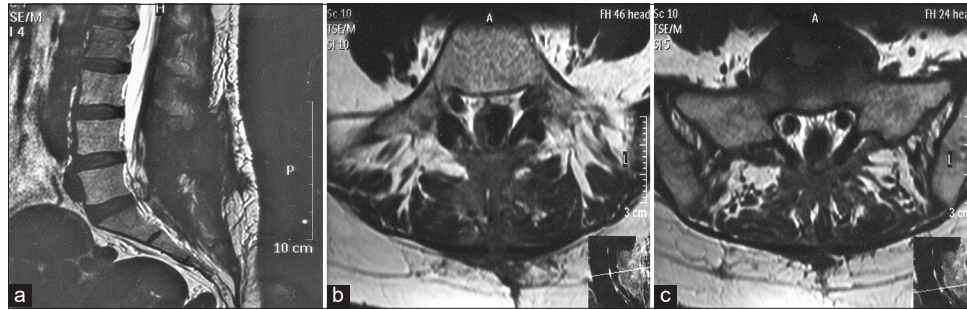
Vertebral or paravertebral metastases develop in 50% of patients with breast or lung cancer and carry poor prognoses.<sup>[8]</sup> Leptomeningeal metastases represent a severe complication of malignant neoplasms and occur in about 5% of patients with solid tumors.<sup>[8]</sup> Gwak *et al.* have shown the Karnofsky performance score for these patients represents the most valuable prognostic factor.<sup>[5]</sup>

### Leptomeningeal carcinomatosis

Notably, leptomeningeal carcinomatosis carries a median survival of just 1.3 months without adequate adjuvant therapy.<sup>[10]</sup> Despite recent advancements in such treatment modalities, 12 out of 14 papers in the neuro-oncology/molecular biology, the literature showed an increased mean overall survival of just 6.08 months. Nevertheless, as in this case, the main objectives for surgical treatment include pain relief and alleviation of neurological symptoms/signs, even if it does not prolong overall survival.



**Figure 2:** Intraoperative images showing exposure of the lesion after dural opening. (a) A good exposure showed the relationships between the neoplasia and the roots of the cauda equina, whose limits did not appear completely distinct. (b) A subtotal excision of the neoplasm has been achieved, with radicular sparing (c).



**Figure 3:** Postoperative lumbosacral magnetic resonance imaging T2-weighted sagittal (a) and axial (b and c) images showed the results of laminectomy and radicular decompression, with a subtotal removal of the lesion.

## CONCLUSION

Lung carcinoma with leptomeningeal metastases involving nerve roots of the cauda equina is extremely rare and carries a poor prognosis. Surgery should be performed to confirm the pathological diagnosis or, if the pathology is already known, to provide pain relief and/or alleviation of neurological symptoms/signs, even if it does not prolong overall survival.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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