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Case Report

Large cell neuroendocrine carcinoma of the lung metastatic to the cauda equina

Asterios Tsimpas, MD, MSc, MRCSEd[a,*], Nicholas H. Post, MD[b], Yaron Moshel, MD, PhD[c], Anthony K. Frempong-Boadu, MD[c]

[a]*Department of Neurological Surgery, University of Miami, Miller School of Medicine, Miami, FL 33136, USA*
[b]*Department of Neurosurgery, SUNY Downstate Medical Center, Brooklyn, NY 11203, USA*
[c]*Department of Neurosurgery, New York University Medical Center, New York, NY 10016, USA*

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Abstract

BACKGROUND CONTEXT: Large cell neuroendocrine carcinoma of the lung is an aggressive tumor with unique histopathological features. It is not known to metastasize to the spine.
PURPOSE: To report a metastatic case of this rare tumor to the cauda equina.
STUDY DESIGN: Case report.
METHODS: Retrospective case review and review of the literature.
RESULTS: The authors report a rare case of a large cell neuroendocrine lung metastasis to the lumbar spine, causing right foot drop. Magnetic resonance imaging revealed a heterogeneously enhancing intradural extramedullary mass at L2/L3 level compressing the surrounding nerve roots. During surgery, the identified nerve roots were encased by the tumor, and the dissection was tedious. Postoperatively, the patient reported significantly improved back pain and he had severe foot weakness. The functional outcome was poor because the patient lost entirely his foot function; however, his back pain improved significantly after surgery.
CONCLUSIONS: This is the first published study in which the authors described a metastasis of a rather uncommon lung cancer to the cauda equina. When a lesion of the cauda equina presents with a rapid progressive neurological deficit, leptomeningeal metastasis should be in the differential diagnosis.

Keywords: Large cell neuroendocrine lung cancer; Metastasis; Cauda equina; Spinal neoplasms

Introduction

Large cell neuroendocrine carcinoma (LCNEC) of the lung is an aggressive tumor that comprises just 2.9% of all primary lung cancers [1]. Large cell neuroendocrine carcinoma of the lung is a unique pathological entity, sharing the histological features of both neuroendocrine tumors and other large cell carcinomas of the lung. In addition to the lung, neuroendocrine large cell carcinomas can occur in various organs, including the prostate, stomach, and bladder [2–4].

In general, the vertebral column is the most common location for skeletal metastases, and up to 70% of patients diagnosed with cancer can have secondary spinal disease. Breast, lung, prostate, kidney, and hematopoietic tumors comprise the vast majority of extradural spinal metastases [5]. Although metastatic involvement of the extradural spine is well described, spread of a primary cancer to the intradural compartment of the spine is uncommon and is seen in just 2% of autopsy cases [6].

Of the published accounts of intramedullary metastasis to the spine, most arise from the lung, and small cell lung carcinoma is the predominant histological subtype [5]. Intradural spread of LCNEC, however, has not been described. The proceeding is a description of an isolated intradural LCNEC metastasis to the cauda equina, presenting with back pain and progressive foot drop.

Case report

The patient is a 62-year-old man with a 120 pack-year history of smoking and chronic obstructive pulmonary disease

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* Corresponding author. Department of Neurological Surgery, University of Miami, Miller School of Medicine, Lois Pope Life Center, 2nd Floor, 1095 NW 14th Terrace (D4-6), Miami, FL 33136, USA. Tel.: (617) 669-6006.
E-mail address: atsimpas@med.miami.edu (A. Tsimpas)

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Fig. 1. (Top Left) Preoperative sagittal T2-weighted, (Top Right) sagittal T1-weighted with contrast, and (Bottom) axial T1-weighted with contrast magnetic resonance image of the heterogeneously enhancing intradural extramedullary mass at the L2/L3 level.

who complained of progressive back pain and right lower extremity weakness progressing to complete foot drop for more than 4 months. He denied any bladder or bowel symptoms. On examination there was severe weakness of his right foot dorsiflexors and extensor hallucis longus (1/5 strength), and loss of the right patellar and ankle jerk reflexes. His sensation to light touch, pinprick, joint position, and temperature, his perianal sensation, and his anal tone were intact.

Lumbar spine magnetic resonance imaging (MRI) demonstrated a heterogeneously contrast-enhancing intradural extramedullary mass measuring 1.8 by 2.7 cm at the L2 level (Fig. 1, Top Left, Top Right, Bottom). The tumor did not extend into the neural foramen and did not involve the conus medullaris.

The patient underwent a L1–L3 laminectomy for tumor resection. During surgery, a firm nodule was appreciated beneath the dura of the L2 level, and it was verified with ultrasound. The dura was opened in the midline, and the nerve roots were gently parted on the dorsal surface of the tumor bringing the superior and inferior portions of the lesion into view. Several nerve roots were engulfed into the substance of the tumor, thereby complicating the tumor dissection. Most of these roots were separable from the tumor; however, two roots remained inseparable and were clearly invaded by tumor. The other nerve roots had adherent tumor on their surface, which was left behind to avoid any further neurological injury to the patient. This procedure was performed without the use of intraoperative