Case Report

Bilateral Facial Nerve Paralysis as First Presentation of Lung Cancer

Shadi Hamouri^a Duha Al Shorafat^b

^aGeneral, Urology and Pediatric Surgery Department, Jordan University of Science and Technology, Faculty of Medicine, King Abdullah University Hospital, Irbid, Jordan;

^bNeurosciences Department, Jordan University of Science and Technology, Faculty of Medicine, King Abdullah University Hospital, Irbid, Jordan

Keywords

Lung cancer · Diagnosis · Cranial nerves · Leptomeningeal metastasis

Abstract

Leptomeningeal carcinomatosis is rare, and its precise incidence is unknown. It is associated with a wide spectrum of solid and hematological malignancies. To complicate its diagnosis, the clinical presentation of leptomeningeal carcinomatosis can be variable. We report a case of a 38-year-old male with bilateral facial nerve paralysis as first presentation of lung adenocarcinoma. To our knowledge, this is the only case describing bilateral facial nerve palsy as the first and only manifestation of lung adenocarcinoma.

© 2016 The Author(s)
Published by S. Karger AG, Basel

Case Report

A 38-year-old male patient with a 40-pack-year history of smoking initially presented with sudden-onset right-sided facial nerve palsy which was diagnosed as idiopathic Bell's palsy and was treated with prednisolone. Three weeks later, the patient developed a new left-sided facial palsy in addition to his unrecovered right-sided facial palsy. The patient denied any systemic symptoms except for a mild headache. His physical examination showed bilateral lower motor neuron facial nerve palsy. Outside of the facial nerve paralysis, he was neurologically intact, and his physical examination revealed no abnormalities. Further

workup was carried out to rule out autoimmune, metabolic, infectious, and vasculitic causes and revealed no abnormality. A chest X-ray showed a right upper lobe opacity which prompted a computed tomography (CT) scan of the chest which showed a well-defined, suspected soft-tissue lesion in the right upper lobe with extensive hilar and ipsilateral mediastinal lymphadenopathy (Fig. 1a, b).

At this point, the differential diagnosis included sarcoidosis and primary lung cancer given the presenting complaint was bilateral facial nerve paralysis. Because the intrapulmonary lesion was too distal to be reached by flexible bronchoscopy, video-assisted mediastinoscopy was performed and revealed gross right-sided mediastinal invasion. Multiple biopsies from lymph nodes were taken and revealed metastatic poorly differentiated adenocarcinoma of the lung. Accordingly, positron emission tomography (PET)/CT and magnetic resonance imaging (MRI) of the brain were performed to stage the cancer. Brain MRI with contrast showed normal enhancement of the seventh and eighth cranial nerves with neither brain metastasis nor leptomeningeal metastasis. The PET/CT showed a metabolically active right upper lobe lesion with extension into the mediastinum and active ipsilateral mediastinal lymph nodes but no distant metastasis. Due to our high clinical suspicion of leptomeningeal involvement, a lumbar puncture was performed. Cerebrospinal fluid (CSF) cultures and cytology were all negative. Additionally, a paraneoplastic panel in his serum and CSF was negative as well. At this point, his clinical stage was considered cIIIB; cT₄ (extension) N₂ M₀. He underwent chemoradiation as his definitive therapy. The patient received platinum-based doublet chemotherapy with a total of 60 Gray of radiation. He tolerated the chemotherapy and radiation well but had no resolution of his facial paralysis. Nine months later, the patient presented to the emergency department with severe headache and generalized tonic-clonic seizures. On physical examination, he was cachectic and still had bilateral facial weakness. A brain CT revealed acute hydrocephalus. An urgent external ventricular drain was inserted. A new brain MRI showed no new changes. Cytology of the withdrawn CSF was positive for metastatic adenocarcinoma. An abdominal and pelvic CT scan was obtained which showed newly developed liver metastases as well. Given the patient's disease progression and deteriorating condition, palliative care was offered, and the patient succumbed to his disease.

Discussion

The incidence of leptomeningeal carcinomatosis has been reported to be between 0.8 and 8% in many autopsy studies, though the true incidence is difficult to determine [1]. Among all known solid tumors, leptomeningeal metastasis is more common in breast cancer, lung cancer, and melanoma [1, 2]. With improvements in survival rates among patients who have cancer, the incidence of leptomeningeal carcinomatosis in patients with non-small-cell lung cancer is increasing [3]. However, small-cell lung cancer is more likely to cause leptomeningeal metastases with a frequency of 10–25%, as compared to 1% in the case of non-small-cell lung cancer [2].

Though leptomeningeal metastasis is a late complication of cancer, it can be the initial presentation in some cases [4]. Our case is one of these cases where neurologic symptoms were the first and only presentation of pulmonary adenocarcinoma. Reviewing the literature, and to the best of our knowledge, our case is the only case describing bilateral facial nerve palsy as the only manifestation of lung adenocarcinoma.

Leptomeningeal metastasis from any source can vary in presentation. Multifocal neurological symptoms and signs should raise the suspicion of leptomeningeal metastasis. However, as demonstrated here, patients may present with a single isolated neurological sign or symptom. Among these, cranial nerve involvement is common. Facial weakness was detected as a sign of an underlying leptomeningeal metastasis in about 13% of cases at the time of presentation [5]. Multiple cases in the literature reported unilateral peripheral facial nerve palsy as the first presentation of an underlying cancer. In some of these cases, the underlying cancer was pulmonary adenocarcinoma [6].

CSF analysis has been considered the gold standard method to diagnose leptomeningeal metastases; however, the false-negative rate seen in many cases (even after repeating the lumbar puncture) makes the diagnosis of leptomeningeal metastases challenging, causing many to suggest using MRI as well as CSF analysis [7]. CSF findings suggestive of leptomeningeal metastases are high cell count, high protein, low glucose, and high CSF opening pressure. MRI of the brain is considered more sensitive in leptomeningeal metastases from solid tumors, while CSF analysis is superior to MRI in cases of hematological malignancies [5, 7]. CSF samples are more likely to have positive findings from either clinically or radiographically diseased areas [8]. Our patient's second CSF sample was drawn directly from the ventricles after his disease had progressed, which may have played a role in the positive result of the CSF cytology.

Statement of Ethics

This material has not been published in whole or in part elsewhere. All authors have been personally and actively involved in substantive work leading to the manuscript and will hold themselves jointly and individually responsible for its content.

Disclosure Statement

The authors declare that no financial or other conflict of interest exists in relation to the content of this paper.

References

- 1 DeAngelis LM, Posner JP: Leptomeningeal metastases; in DeAngelis LM, Posner JP (eds): *Neurologic Complications of Cancer*, ed 2. New York, Oxford University Press, 2009, pp 240–281.
- 2 Le Rhun E, Taillibert S, Chamberlain MC: Carcinomatous meningitis: leptomeningeal metastases in solid tumors. *Surg Neurol Int* 2013;4(suppl 4):S265–S288.
- 3 Lee SJ, Lee JI, Nam DH, et al: Leptomeningeal carcinomatosis in non-small-cell lung cancer patients: impact on survival and correlated prognostic factors. *J Thorac Oncol* 2013;8:185–191.
- 4 Rao R, Sadashiv SK, Goday S, Monga D: An extremely rare case of pancreatic cancer presenting with leptomeningeal carcinomatosis and synchronous intraparenchymal brain metastasis. *Gastrointest Cancer Res* 2013;6:90–92.
- 5 Clarke JL: Leptomeningeal metastasis from systemic cancer. *Continuum (Minneapolis)* 2012;18:328–342.
- 6 Yserbyt J, Wilms G, Lievens Y, Nackaerts K: A 63-year-old man with peripheral facial nerve paralysis and a pulmonary lesion. *Acta Clin Belg* 2009;64:231–234.
- 7 Clarke JL, Perez HR, Jacks LM, Panageas KS, Deangelis LM: Leptomeningeal metastases in the MRI era. *Neurology* 2010;74:1449–1454.

- 8 Chamberlain MC, Kormanik PA, Glantz MJ: A comparison between ventricular and lumbar cerebrospinal fluid cytology in adult patients with leptomeningeal metastases. *Neuro Oncol* 2001;3:42–45.

Fig. 1. a, b Computed tomography of the chest showing the suspected lesion in the right upper lobe with extension to the mediastinum and enlarged ipsilateral station 4 lymph nodes (a mediastinal window; b lung window).