Oculomotor Nerve Palsy Caused by Lung Cancer Metastasis

Hiroichi Ishikawa, Hiroaki Satoh, Masachika Fujiwara*, Hiroshi Kamma*, Yuko T. Yamashita, Takashi Naito, Morio Ohtsuka and Shizuo Hasegawa

A 39-year-old man with a known diagnosis of lung adenocarcinoma developed intermittent double vision with right pupil dilatation. His symptoms eventually progressed to complete oculomotor nerve palsy on the right. Postmortem examinations revealed a metastasis of the adenocarcinoma involving the root of right oculomotor nerve.

(Internal Medicine 36: 301-303, 1997)

Key words: double vision, cranial nerve involvement, adenocarcinoma

Introduction

The incidence of adenocarcinoma of the lung has been increasing in recent years (1-3). Although it is well known that adenocarcinoma of the lung can metastasize to various organs including the central nervous system (4), the involvement of the cranial nerve is uncommon and metastasis to the oculomotor nerve root has not been described previously. In this report, we present a 39-year-old man with lung adenocarcinoma which metastasized to the oculomotor nerve.

Case Report

A 39-year-old man visited the pulmonary clinic with cervical lymph node swelling which he noticed three months prior to the presentation. He had been basically healthy without significant past medical history. His examination revealed cervical lymphadenopathy (3.0 x 2.0 cm) on the left. His chest X-ray film and computed tomographic (CT) scan on admission showed a 2.0 x 1.8 cm tumor of left S3 and multiple small nodular lesions on both lungs with enlarged mediastinal lymph nodes. A bronchoscopic biopsy of the tumor was performed and the pathology demonstrated moderately differentiated adenocarcinoma of the lung. A CT scan of the brain and a ultrasound echogram of the abdomen performed on hospital day 5 showed no metastasis. The bone scintigram revealed multiple accumulations. We clinically diagnosed this patient as lung adenocarcinoma of left S3; clinical T1N3M1 stage IV.

On hospital day 33, he was noted to have mild ptosis on the right. Two days later, he started to complain of intermittent double vision. There was no proptosis, bruit or conjunctival injection. He did not complain of ophthalmalgia. The ophthalmologic examinations revealed that his right pupil was dilated to 7 mm in diameter and fixed. The left pupil was 3 mm and was reactive to light and accommodation. Extraocular movement to the right was impaired in abduction with intorsion on attempting downward gaze. Left extraocular movement was intact. Both visual acuity and visual fields were within normal limits. A repeated CT scan of the brain with contrast material was performed on hospital day 36, and showed a 1.2 x 1.0 cm enhanced mass lesion at the junction of the right communicating artery and the posterior cerebral artery, a characteristic site of cerebral aneurysm (Fig. 1). There were no abnormal findings or other lesions. In order to discriminate the aneurysm, we planned to perform magnetic resonance imaging (MRI). However his oculomotor palsy was progressively becoming worse. Therefore we immediately performed a digital subtraction angiography (DSA). If the lesion proved to be an aneurysm, we considered treatment with a coil embolization.

DSA of the bilateral common carotid arteries and right vertebral artery revealed, however, no aneurysm and the mass was suspected to be a metastatic lesion of the lung cancer. We performed lumbar puncture and meningeal carcinomatosis was ruled out by cerebrospinal fluid cytology. He was started on chemotherapy consisting of cisplatin, vindesine and ifosfamide on day 42 of admission. Chemotherapy did not achieve any response and his oculomotor palsy continued. He underwent radiation therapy for the brain and lumbar spine.

The patient suddenly died with massive hemoptysis 15 weeks after admission. The postmortem examination revealed papillary adenocarcinoma of the lung, bronchial surface epithelial cell type metastasis to the regional lymph nodes and lungs.
Figure 1. A contrast-enhanced CT scan of the brain shows a 1.2 × 1.0 cm enhanced mass lesion (arrow) at a junction of the communicating artery and the posterior cerebral artery on the right.

Figure 2. Transverse section of autopsied left lung shows an irregular-shaped gray-white, hard necrotic tumor in S³ (arrow), multiple intrapulmonary metastases, and hilar and mediastinal lymph node metastases (arrowhead).

Figure 3. Gross appearance of brain shows a 1.4 × 1.0 cm tumor (arrow) at the root of the oculomotor nerve on the right.

Figure 4. Microscopic examination (HE stain, ×400) shows the infiltration of cancer cells into the root of the oculomotor nerve (arrows).
Oculomotor Nerve Palsy by Lung Cancer

Discussion

We reported a patient with adenocarcinoma of the lung which widely metastasized to lungs, bones and brain. This patient developed a third-nerve palsy on the right. He eventually died of massive hemoptysis from the primary site of the lung cancer. The postmortem examinations revealed that the patient had a solitary midbrain metastasis involving the left oculomotor nerve nucleus and rootlets (10) as predicted by the neurological examinations.

Until angiography was performed, we misinterpreted the metastatic lesion as a cerebral aneurysm located at the junction of the communicating artery and the posterior cerebral artery on the right, due to the characteristic site on CT scan and the progressive oculomotor palsy. If we had first performed cranial MRI examination, we might not have misdiagnosed it.

In this report, a case of lung cancer that directly metastasized to the root of the oculomotor nerve is presented.

Acknowledgements: The authors wish to thank Dr. Kiyoshi Narushima for his help in preparing this manuscript.

References