**Solitary Metastasis of Lung Cancer to the Cerebellopontine Angle**

---Case Report---

Manabu MINAMI, Junya HANAKITA, Hideyuki SUWA, Hiroshi SUZUI, Kohji FUJITA, and Takehiko NAKAMURA

Department of Neurosurgery, Shizuoka General Hospital, Shizuoka

**Abstract**

A 44-year-old male presented with a solitary cerebellopontine angle (CPA) metastasis from lung cancer. His initial symptoms were vertigo and hearing loss beginning 5 months after the diagnosis of the primary cancer. Two months later, right facial paresis developed. His neurological deterioration was rapid. Magnetic resonance (MR) imaging with enhancement disclosed the CPA tumor. The tumor was partially removed through the retroauricular retromastoid approach. Histological examination of the specimen revealed adenocarcinoma. The characteristic rapidly progressive symptoms and MR imaging with enhancement are the most sensitive and essential examinations for this lesion.

**Key words:** cerebellopontine angle tumor, magnetic resonance imaging, metastasis

**Introduction**

Intracranial metastases account for approximately 15% of brain tumors, and commonly involve the supratentorial regions. Cerebellopontine angle (CPA) metastases occur as only 0.9% of intracranial metastases. Most CPA lesions are benign tumors, of which the most common are acoustic neuromas.6-11 Metastases are responsible for only 0.2-2% of all CPA tumors.2-5,7,9-11 Only 28 cases of CPA metastasis have been reported. The primary malignancies included lung cancer, breast cancer, prostate cancer, lymphoma, melanoma, and squamous cell carcinoma of the pharynx.

We report a case of solitary metastasis from lung cancer to the CPA.

**Case Report**

A 44-year-old male was diagnosed as having stage IIIB lung cancer by biopsy of a right cervical swelling lymph node in November 1992. He achieved partial response to irradiation and chemotherapy. He had suffered from vertigo and right hearing loss since April 1993, and was referred to an otolaryngologist. Skull x-ray films, computed tomography (CT), and magnetic resonance (MR) imaging in May 1993 showed no abnormalities. He was treated with steroids, but no improvement was observed. He presented with right facial paresis in June 1993, when repeat MR imaging revealed a CPA tumor as a dumbbell-shaped extraaxial mass just lateral to the right lower pons. The mass encased the seventh and eighth cranial nerves, extending into the right internal auditory meatus. The tumor was isointense on T1- and T2-weighted images, and was homogeneously enhanced with gadolinium (Fig. 1). Cerebral angiography revealed no abnormal findings.

Neurological examination found right facial paresis and right tinnitus. An audiogram showed complete right hearing loss. The trigeminal nerve was intact, and there was no cerebellar sign. Cerebrospinal fluid (CSF) examination found positive signs for malignancy (class V).

A retroauricular retromastoid approach on June 28, 1993 exposed a mass surrounding the seventh cranial nerve and encasing the eighth cranial nerve. The right internal auditory meatus did not appear to...
be eroded. The tumor had invaded the right internal auditory meatus and the right lower pons (Fig. 2). The tumor was partially removed. Histological examination revealed adenocarcinoma identical to the biopsy of the primary lung cancer.

He was transferred to the department of respiratory medicine for radiation therapy of the recurrent primary lesion. Although he spent the New Year at home without consciousness disturbance, he died of respiratory dysfunction on March 30, 1994.

**Discussion**

The following characteristics of clinical manifestation of CPA tumors should be investigated. Benign CPA tumors including acoustic neurinoma and meningioma are typically slow growing, so are frequently asymptomatic until they become large. In general, patients with benign CPA tumors show the symptoms of eighth cranial nerve dysfunction, such as hearing loss and tinnitus, and rarely other cranial nerve dysfunctions. In contrast, the symptoms of the metastatic CPA tumors are rapidly progressive except for prostatic metastases. Not only eighth cranial nerve but also seventh and fifth cranial nerve functions are disturbed in CPA metastases.

Reports about the radiological findings of the CPA metastases are limited. As CPA metastases rapidly invade into the internal auditory meatus, plain skull x-ray films and bone window CT rarely show erosion. Soft tissue window CT of CPA metastases show similar findings to those of acoustic neurinomas. Such CT scans show metastatic CPA tumors as isodense to the brain tissues with enhancement. MR imaging findings of CPA metastases are even more scarce. CPA metastases are relatively isointense lesions on T1- and T2-weighted images, so MR imaging with enhancement is essential. In contrast, acoustic neurinomas typically appear as high signal intensity on T2-weighted images. MR imaging can demonstrate the cranial nerves and the extent of involvement in the metastatic tumor as in the present case, and is therefore the most sensitive examination for CPA metastases.

CSF cytology or meningeal biopsy showed positive signs for malignancy in all the reported cases. Direct leptomeningeal invasion or dissemination through the CSF are the most likely mechanisms of metastases to the CPA.

The differential diagnosis between metastatic and benign CPA tumors is important for patient management. The fact that benign CPA tumors are more common than metastatic lesions even in cancer patients must be taken into consideration at differential diagnosis. The rapidly progressive eighth, seventh, and fifth cranial nerve dysfunctions are the
characteristic clinical symptoms, and MR imaging with enhancement is the most sensitive method for the diagnosis of CPA metastasis.

References


Address reprint requests to: M. Minami, M.D., Department of Neurosurgery, Mie University School of Medicine, 2–174 Edobashi, Tsu 514, Japan.