

Cerebellopontine angle metastases

Metastatic lesions in the [cerebellopontine angle](#) (CPA) are rare and are commonly associated with [breast cancer](#) or [lung cancer](#).

In a retrospective series of 1345 patients with CPA lesions the common underlying diagnoses were VS (91.3%), meningiomas (3.1%), epidermoids (2.4%) and facial nerve schwannomas (1.2%). Other rare causes (2%) included lipomas, gliomas, dermoids, arachnoid cysts, hemangiomas, hemangioblastomas, medulloblastomas, chondrosarcomas, malignant teratomas and metastasis ¹⁾.

Clinical features

Isolated metastases to the CPA represent a diagnostic challenge to differentiate them from the more commonly occurring CPA lesions, particularly in the absence of metastatic disease ²⁾.

In a small series of 14 patients with metastasis to the CPA, this was the initial presentation of the underlying malignancy in 4 (28%) ³⁾.

Features suggestive of metastasis as opposed to schwannoma were acute onset, rapid progression of symptoms, associated seventh and/or eighth nerve deficits, bilateral involvement or systemic metastasis. Useful MRI findings included small and/or bilateral CPA enhancing lesions with relative isointensity to brain parenchyma on pre-contrast MRI and associated findings of multiple and/or bilateral cranial nerve and/or leptomeningeal lesions ⁴⁾.

Case series

2017

Ten patients were reviewed for the period between 2008 and 2015. The clinical and neuroimaging features, and treatment outcomes were analyzed retrospectively. The average period during primary diagnosis through the diagnosis of CPA metastases was 42.4 months. Among the 10 cases, the primary tumors and metastases were found simultaneously in 3 cases, the metastases after primary tumor removal were found in 5 cases, and the metastases after stereotaxic radiosurgery were found in 2 cases. Only 4 patients presented with the symptoms and signs associated with CPA involving, one with hearing loss, one presenting facial paralysis, one suffering from tinnitus and one case with dizziness. There were 2 cases with the miliary metastases and 8 cases with massive metastases. There existed 3 cases with single CPA metastases, whereas 7 cases with multiple metastatic foci. Among the 8 cases of massive metastatic foci, 6 tumors presented the solid features and the other 2 cases exhibited cystic and solid features. In this cohort of cases, 4 cases were involved in the bilateral and 6 cases presented unilateral metastatic foci. The three CPA metastases were removed in this group, 6 case performed with radiotherapy, and 5 cases received chemotherapy. In the current group 5 patients have been dead, 3 patients kept stable and 2 cases experienced improvement. In spite of seldom previous reports regarding the metastases from CNS tumors occurring in the CPA are existent, this rare form of the disease should be considered in future evaluation as a differential diagnosis ⁵⁾.

2002

A total of 174 cancer patients with inner ear-related symptoms such as vertigo, hearing loss, or tinnitus were seen at the university hospital from January 1994 to December 2000. All patients underwent a battery of audiologic and neurotologic tests. Magnetic resonance imaging was performed either when the clinical presentation suggested vertigo of central origin or when sensorineural hearing loss developed.

Magnetic resonance imaging confirmed tumors of the cerebellopontine angle in 6 (3%) of the 174 patients, including 3 men and 3 women. Their ages ranged from 46 to 80 years (mean 62 years). The final diagnoses were breast cancer with cerebellopontine angle metastasis (1), breast cancer with cerebellopontine angle epidermoid cyst (1), colon cancer with cerebellopontine angle metastasis (1), colon cancer with acoustic neuroma (1), nasopharyngeal carcinoma with cerebellopontine angle metastasis (1), and nasopharyngeal carcinoma with cerebellopontine angle benign tumor (1).

When a cerebellopontine angle tumor is discovered in a cancer patient, metastatic cancer should be suspected when the tumor presents with deficits of the VIIth and VIIIth cranial nerves of rapid progression or bilateral involvement, or extracranial systemic metastasis. Laboratory examinations such as cytologic study of the cerebrospinal fluid and serologic study can assist in the diagnosis ⁶⁾.

Case reports

2016

A 61-year-old man, who visited an otorhinolaryngology clinic with complaints of rapidly progressing bilateral hearing impairment and facial palsy. The patient was referred to our hospital because tumorous lesions were suspected in the bilateral cerebellopontine angles on brain magnetic resonance imaging. Regarding tumor markers, the patient's cancer antigen 19-9 and carcinoembryonic antigen levels were high, which suggested metastasis. However, no abnormal findings other than abdominal lymph node enlargement were detected on whole-body examination, and no primary lesion was identified. The tumor in the right cerebellopontine angle was excised using the lateral suboccipital approach and subjected to pathological examination. It was diagnosed as an adenocarcinoma; thus, both lesions were considered brain metastases from a malignant abdominal tumor, and radiochemotherapy was administered to the patient. Unfortunately, the patient died after 89 days of treatment, and a pathological autopsy revealed that the primary lesion was a common bile duct tumor. No dural metastasis was noted in the brain or spinal cord; however, tumors were detected in the epiarachnoid space during surgery. Metastasis to the bilateral cerebellopontine angles occurred in the same period, which was indicative of ascending metastasis through the vertebrobasilar artery. Hence, we suggest that progressive bilateral hearing impairment and facial palsy were a consequence of brain tumors that had metastasized bilaterally to the cerebellopontine angles ⁷⁾.

2015

A 63-year-old male who underwent surgical resection of a poorly differentiated small cell carcinoma, likely from a small intestinal primary tumor that metastasized to the cerebellopontine angle (CPA). A 63-year-old male presented with mild left facial paralysis, hearing loss, and balance instability. MRI

revealed a 15 mm mass in the left CPA involving the internal auditory canal consistent with a vestibular schwannoma. Preoperative MRI eight weeks later demonstrated marked enlargement to 35 mm. The patient underwent a suboccipital craniectomy and the mass was grossly different visually and in consistency from a standard vestibular schwannoma. The final pathology revealed a poorly differentiated small cell carcinoma. Postoperative PET scan identified avid uptake in the small intestine suggestive of either a small intestinal primary tumor or additional metastatic disease. The patient underwent whole brain radiation therapy and chemotherapy and at last follow-up demonstrated improvement in his symptoms. Surgical resection and radiotherapy are potential treatment options to improve survival in patients diagnosed with NET brain metastases. We present the first documented case of skull base metastasis of a poorly differentiated small cell carcinoma involving the CPA ⁸⁾.

2005

This is the first formal case report of internal auditory canal and cerebellopontine angle metastasis from infiltrative ductal carcinoma of the breast. Only three previous cases have been reported of isolated metastasis in the cerebellopontine angle and internal auditory canal from breast cancer. Currently, no therapeutic guidelines for isolated metastasis from breast cancer in this location exist. We report a case and review the current literature in order to help characterize the clinicopathologic features and management. A 72-year-old female with a 5-year history of left infiltrative ductal carcinoma of the breast reported progressive left-sided facial palsy and ipsilateral hearing loss accompanied by the development of tinnitus and unsteadiness during the previous 3 months. MRI identified a lesion in the cerebellopontine angle and internal auditory canal. The lesion was completely excised via a retrosigmoidal approach and adjuvant radiotherapy was used subsequently. The patient remains well 18 months after treatment, with no evidence of recurrence on repeat MRI. The rapid evolution of symptoms involving the Vth, VIIth or VIIIth cranial nerve, or multiple cranial nerves, is suggestive of a malignant lesion of the cerebellopontine angle and/or internal auditory canal. A previous history of neoplasm is important due to the possibility of a metastasis. Cerebellopontine angle metastasis can be found many years after the initial diagnosis of breast neoplasm. Surgery and adjuvant radiotherapy seems to be a good choice for the treatment of patients with this specific type of metastasis ⁹⁾.

Bilateral cerebellopontine angle (CPA) tumors identified on MRI are considered bilateral acoustic neuromas, the definitive diagnostic criterion of neurofibromatosis 2 (NF-2). We report the case of a 67-year-old man with progressive bilateral hearing loss, vertigo, and imbalance. MRI revealed bilateral enhancing CPA lesions, which were suggestive of acoustic neuromas and a diagnosis of NF-2. However, autopsy showed metastatic adenocarcinoma of the lung. Therefore, metastatic carcinoma to the CPA can mimic bilateral acoustic neuromas; imaging studies alone may be insufficient to diagnose NF-2 ¹⁰⁾.

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