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CASE REPORT
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A Case of Isolated Temporal Bone Metastasis in a Lung Cancer Patient with a History of Otitis Media

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Metastatic carcinoma involving the temporal bone is an unusual occurrence. Symptoms of hearing loss, vertigo, facial nerve paralysis, and tinnitus overlap those of chronic mastoiditis, and correct diagnosis may be delayed. A case of solitary distant metastasis of lung cancer to the temporal bone presenting as acute unilateral facial palsy complicating preexisting chronic otomastoiditis is reported. When a known cancer patient whose primary disease is controlled presents with otologic symptoms and a history of chronic mastoid infection, metastatic carcinoma of the temporal bone must be considered as an uncommon, but possible diagnosis.

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KEY WORDS: Metastasis · Lung cancer · Temporal bone · Facial palsy.

Introduction

Metastatic malignant tumors of the temporal bone are relatively uncommon. Secondary malignancies of the temporal bone most often originate from the breast, lungs, kidneys, stomach, bronchi, or prostate.[1,2] Involvement of the temporal bone usually occurs late in the disease process; thus, multiple diffuse metastases are typically present throughout the body by the time it is diagnosed.[3] Reports previously showed that temporal bone metastases were not observed in cancer patients in which the primary tumor was adequately treated.[2]

Symptoms of temporal bone metastasis include hearing loss, vertigo, facial nerve paralysis, and tinnitus. However, patients are often asymptomatic until late in the course of the disease.[4] Such otologic manifestations mimic chronic mastoid infections and their complications. In cases involving pre-existing middle ear diseases, correct diagnosis is even more difficult. Here, we report a case of isolated distant metastasis of lung cancer to the mastoid portion of the temporal bone in a patient whose primary tumor had been treated. The patient presented with concurrent mastoid infection, which further complicated proper diagnosis.

Case Report

A 61-year-old woman presented with a right-sided facial palsy of sudden onset. She had been diagnosed with large cell adenocarcinoma in the left lower lobe of the lung with no evidence of distant metastasis (pT2N0M0) and had undergone mediastinoscopy and left pneumonectomy in our hospital 3 months earlier. She had a long standing history of chronic otitis media on the right side, and complained of decreased hearing in that ear. Physical examination showed a peripheral facial palsy of House-Brackman Grade V; this worsened to Grade VI over the next few days. Otoscopic examinations revealed an attic destruction of the right tympanic membrane and a mild non-tender swelling over the right mastoid area. Audiometric and tympanometric evaluation revealed severe right-side conductive hearing loss and a B-type tympanogram. Tests on the left side showed normal results.

Under the initial suspicion of a facial nerve complication stemming from chronic mastoiditis, a computed tomography (CT) of temporal bone was taken. This revealed a diffuse, infiltrating soft tissue density lesion in the right mastoid bone. The mastoid segment of the facial nerve appeared to be exposed from the bony canal and indistinguishable from the

soft tissue density abnormally filling the mastoid air cells (Fig. 1A). As a manifestation of distant metastasis of lung cancer to the temporal bone was considered a feasible etiology at this point, further evaluation was performed. A magnetic resonance imaging (MRI) of the brain taken one month prior (as a follow-up) was scrutinized. T1-weighted images revealed an enhancing mass lesion in the right mastoid bone, which had been incorrectly disregarded as chronic inflammation (Fig. 1B). A whole-body bone scan using iodine-131 was taken. Compared to a previous bone scan three months earlier which showed no abnormality (Fig. 2A), a solitary high uptake lesion located in the right mastoid area was definite in this study (Fig. 2B). No other distant metastasis was found. A routine chest CT showed no evidence of recurrence of the primary disease. An incisional biopsy via a small retroauricular incision was performed; pathologic examination also confirmed the metastatic carcinoma in the mastoid bone (Fig. 3). Irregular epithelial cell nests composed of polygonal shaped pleomorphic cells with enlarged hyperchromatic nuclei are scattered in the fibrotic stroma.

The patient was referred to the oncology department for chemotherapy and radiation therapy. The therapeutic plan included external radiation (total 6,000 cGy) followed by systemic chemotherapy. Two weeks into radiation therapy the patient presented with generalized weakness and poor oral intake and was admitted. Laboratory findings confirmed pneumonia and hypokalemia. The lung condition aggravated despite medical treatment and within another 2 weeks, she died of acute respiratory distress syndrome and septic shock. During the six weeks following onset, the patient's facial palsy showed no improvement.

Discussion

Distant metastasis to the temporal bone is considered to occur more frequently than is typically perceived. The number of individual cases reported in the literature has increased to more than 200 cases.[5-9] Distant metastasis to the temporal bone is thought to occur primarily in tumors with a predilection for bone metastasis. Berlinger et al. discussed five types of temporal bone involvement in cases of metastatic carcino-

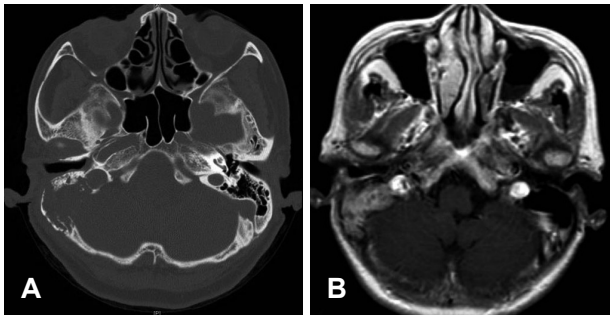

Fig. 1. An axial image from computed tomography (CT) of the temporal bone reveals a diffuse, infiltrating soft tissue density lesion in the right mastoid bone (A). Contrast-enhanced T1-magnetic resonance image (MRI) taken one month earlier shows an enhancing mass lesion in the right mastoid area (B).

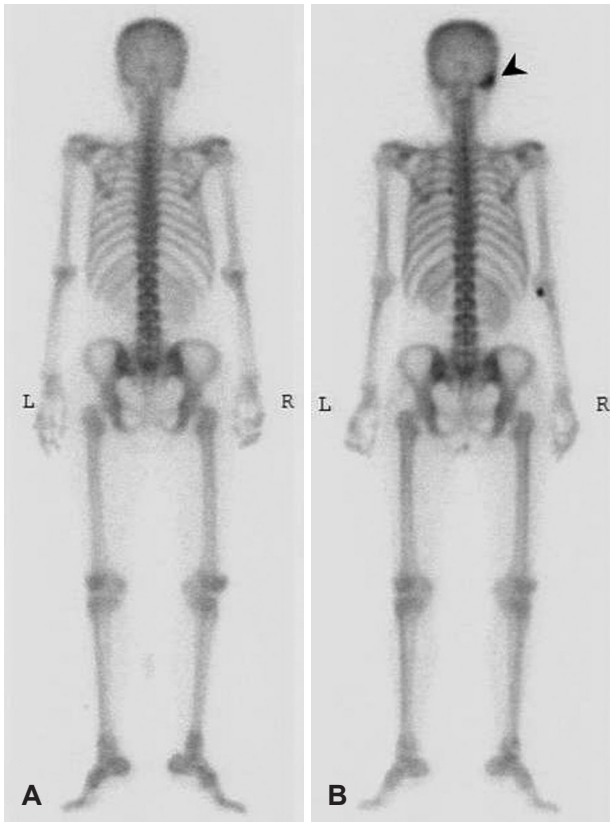

Fig. 2. A whole-body bone scan performed three months prior displays no evidence of distant metastasis (A). A recent whole-body bone scan shows the right temporal bone metastasis and the absence of other distant diseases (B).

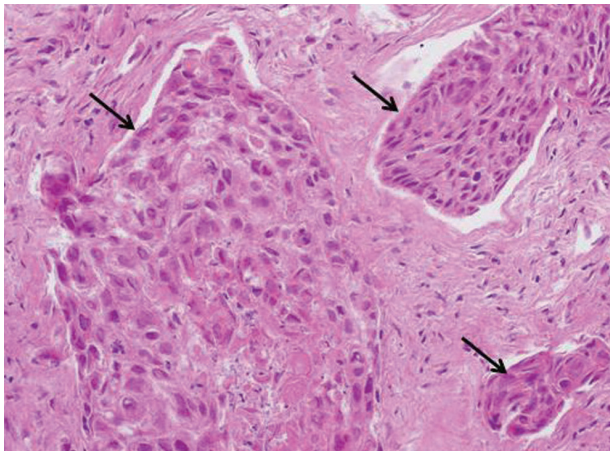

Fig. 3. Incisional biopsy using a retroauricular approach to the mastoid lesion confirmed metastatic disease. Irregular epithelial cell nests composed of polygonal shaped pleomorphic cells with enlarged hyperchromatic nuclei are scattered in the fibrotic stroma (arrows)(H&E, 200×).

ma: 1) isolated metastasis from a distant primary tumor; 2) meningeal carcinomatosis; 3) direct extension from a regional primary tumor; 4) leptomeningeal extension from an intracranial primary tumor; and 5) leukemic or lymphomatous infiltration.[10] Isolated involvement of the temporal bone is common in tumors including kidney, lung, breast and thyroid.[10] However, it has been suggested that if the primary tumor is adequately removed there is little chance for metastasis. Also, isolated metastasis to the temporal bone by hematogenously spread tumors is relatively unlikely in cases of well-controlled tumors, according to previous reports.[2] We report an example demonstrating that this may not always be the case. The patient had neither evidences of residual or recurrent primary lung cancer, nor any evidence of other distant disease when metastasis to the temporal bone was diagnosed. Thus, control of the primary tumor and the lack of multiple metastases do not exclude the possibility of tumors of the temporal bone.

Patients with temporal bone cancer can present with a variety of otologic symptoms. Hearing loss, facial paralysis, periauricular swelling, aural discharge, otalgia, vertigo, aural mass, and tinnitus are some of the more commonly reported symptoms.[7] Initial presentations may be difficult to differentiate from non-tumorous conditions, such as chronic mastoiditis and its complication or Bell's palsy. Furthermore, a known history of chronic mastoid infection may disarm the physician's suspicion of possible metastasis to the temporal bone in a cancer patient, as in this case. The patient had suffered with ipsilateral hearing impairment from chronic otitis media for several years. At first, peripheral facial palsy was surmised as a complication of pre-existing otomastoiditis until a CT scan revealed a bone-destructive lesion in the mastoid bone not attributable to chronic inflammation. Thus, the manifestation of the otologic symptoms of chronic otitis media or the appearance of complications such as facial palsy in a known cancer patient should alert the physician of possible metastatic involvement of the temporal bone and should warrant more aggressive diagnostic efforts.

In conclusion, when middle ear infection symptoms or compli-cations such as facial palsy newly develop, or when pre-existing otomastoiditis acutely worsens, it should warn the physician of possible metastasis of the temporal bone, even if the primary tumor has been treated and no other distant metastasis has been found.

REFERENCES

1) Streitmann MJ, Sismanis A. Metastatic carcinoma of the temporal bone. Am J Otol 1996;17:780-3.
2) Gloria-Cruz TI, Schachern PA, Paparella MM, Adams GL, Fulton SE. Metastases to temporal bones from primary nonsystemic malignant neoplasms. Arch Otolaryngol Head Neck Surg 2000;126:209-14.
3) Nelson EG, Hinojosa R. Histopathology of metastatic temporal bone tumors. Arch Otolaryngol Head Neck Surg 1991;117:189-93.
4) Henrich DE, Gantz BJ, Moore SA, Schubkegel AJ. Undifferentiated small-cell neoplasm of the petrous apex: a case report. Arch Otolaryngol Head Neck Surg 1992;118:767-70.
5) Maddox HE. Metastatic tumors of the temporal bone. Ann Otol Rhinol Laryngol 1967;76:149-65.
6) Schuknecht HF, Allam AF, Murakami Y. Pathology of secondary malignant tumors of the temporal bone. Ann Otol Rhinol Laryngol 1968;77:5-22.
7) Hill BA, Kohut RI. Metastatic adenocarcinoma of the temporal bone. Arch Otolaryngol 1976;102:568-71.
8) Belal A Jr. Metastatic tumors of the temporal bone: a histopathological report. J Laryngol Otol 1985;99:839-46.
9) Feinmesser R, Libson Y, Uziely B, Gay I. Metastatic carcinoma to the temporal bone. Am J Otol 1986;7:119-20.
10) Berlinger NT, Koutroupas S, Adams G, Maisel R. Patterns of involvement of the temporal bone in metastatic and systemic malignancy. Laryngoscope 1980;90:619-27.