Case Report / Olgu Sunumu

Metastatic adenocarcinomas of the temporal bone: a report of three cases

Temporal kemiğin metastatik adenokarsinomları: Üç olgu sunumu

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We reported three cases with adenocarcinomas of the lung, prostate and stomach, which metastasized to the temporal bone. Two of them had proven adenocarcinoma of the lung and stomach, respectively at the time of the diagnosis of the temporal bone tumor. But the other patient had no known primary malignancy when the tumor in the petrous apex was demonstrated radiologically. First he underwent biopsy of the petrous apex lesion and the pathology was reported as malignant; then a probable distant malignancy spreading to the temporal bone was suspected and searched for. Subsequently, his prostate adenocarcinoma was proved with prostate biopsy.

Key Words: Adenocarcinoma; metastasis; temporal bone.

Bu yazıda temporal kemiğe metastaz yapan akciğer, prostat ve mide adenokarsinomlu üç olgu sunuldu. Temporal kemik tümörü tanısı konulduğunda, iki hastada varlığı kanıtlanmış akciğer ve mide adenokarsinomu mevcuttu. Fakat, diğer hastanın petröz apeksteki kitlesi radyolojik olarak saptandığında bilinen primer bir malignitesi yoktu. İlk olarak petröz apeks biyopsisi yapıldı ve patoloji sonucu malign olarak bildirildi; bunun üzerine temporal kemiğe metastaz yapma olasılığı olan uzak bir maligniteden şüphelenilerek araştırma yapıldı. Daha sonra hastanın prostat adenokarsinomu, prostat biyopsisi ile kanıtlandı.

Anahtar Sözcükler: Adenokarsinom; metastaz; temporal kemik.

The temporal bone may be invaded by metastases from distant primaries.[1] Involvement of the temporal bone by metastasis from distant primaries usually occurs at an advanced stage of the primary disease and usually progresses asymptomatically.[1,2] When symptoms appear, generally widespread involvement of the temporal bone is already seen on radiologic imaging. Facial paralysis, periauricular swelling and otalgia are the most common symptoms.[2,3] The most common sites of distant malignancies metastasizing to the temporal bone are breast, lung, kidney, prostate and thyroid, all of which have a known tendency to metastasize to the bone.[1,3-5] In spite of their rarity, metastatic diseases should be considered as a possible etiology in patients with a history of previous distant malignant neoplasm who present with otologic symptoms.[1] In this paper we present three cases of temporal bone metastases from

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three distinct distant primaries which were the lung, prostate and stomach, respectively.

CASE REPORT

Case 1– A 73-year-old woman presented with a one-month history of severe headache, progressive dysphagia, right-sided otalgia and facial weakness. It was learned from her past medical history that she had undergone a left lower lobectomy for primary lung adenocarcinoma two years ago and no adjuvant radiotherapy or chemotherapy had been administered. On physical examination, right-sided House-Brackmann (HB) grade 4 facial paralysis and paralyses of the right 9^{th} to 12^{th} cranial nerves were detected. Otoscopic examination revealed normal external auditory canals and tympanic membranes bilaterally. Pure tone audiogram revealed total sensorineural deafness of the right ear. Computed tomograpy (CT) of the temporal bone showed the mass invading the right petrous apex, encompassing the jugular bulb, extending to the occipital bone (figure 1). She was diagnosed as having a metastatic temporal bone tumor from primary lung adenocarcinoma and a dose of 30 Gy palliative radiotherapy was administered to the metastatic side. She died two months after the diagnosis.

Case 2– A 56-year-old man presented with a two-month history of right-sided severe otalgia, hearing loss and vertigo with nausea and vomiting. Otoscopy and cranial nerve examinations were normal. Pure-tone audiogram showed a sensorineural hearing loss of 58 dB in the right ear. Magnetic resonance imaging (MRI) of the temporal bone revealed the infiltration of the right petrous apex and right half of the clivus (figure 2). The tympanic cavity and external auditory canal were normal on both CT and MRI. After radiologic evaluation, he underwent a biopsy of the petrous apex lesion via a transmastoid, intralabyrinthine approach. Frozen section was used to confirm a probable malignancy and was reported as showing the features of a carcinoma. Therefore, metastasis from a distant malignancy was suspected and further evaluations were performed to find the primary site. Elevation in serum prostate-specific antigen (PSA) level together with a suspicious transrectal ultrasonography report necessitated a prostate biopsy revealing an adenocarcinoma Gleason grade 4 resembling the petrous apex tumor histologically. According to these findings, the patient was diagnosed as having prostate adenocarcinoma, metastatic to the temporal bone and radiotherapy was administered to the metastatic site. He died eight months after the diagnosis.

Case 3– A 50-year-old man who had undergone partial gastrectomy seven months before for poorly differentiated adenocarcinoma of the stomach consulted for right-sided facial paralysis persisting for 15 days. Otoscopy revealed a hemorrhagic mass filling the right external ear canal. Postauricular

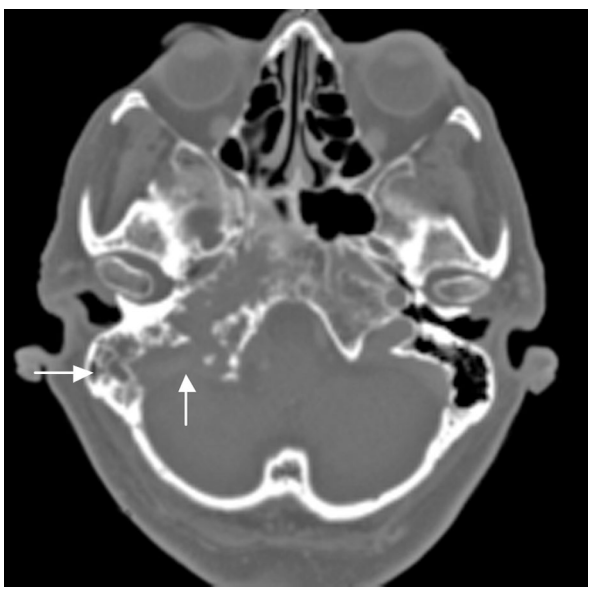

Figure 1. *Axial computed tomography scan showing the extensive destruction of the right temporal bone (arrows).*

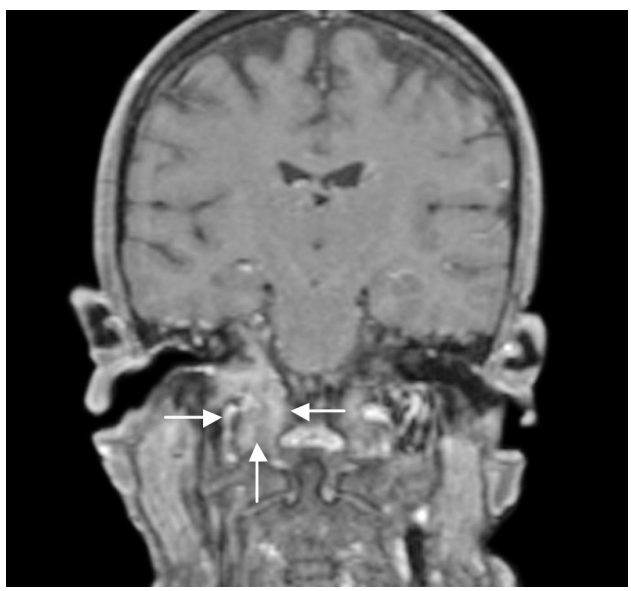

Figure 2. *Coronal magnetic resonance imaging showing the infiltration of the right petrous apex and the right half of the clivus (arrows).*

Figure 3. *Axial computed tomography showing the soft tissue density in the right middle ear cavity (arrows).*

swelling was detected on physical examination in addition to a HB grade 4 right-sided facial paralysis. The functions of the other cranial nerves were normal. Computed tomography of the temporal bone showed a mass obliterating the external ear canal and the tympanic cavity, extending to the sigmoid sinus and jugular foramen (figure 3). There was osteolytic destruction of the mastoid by the metastatic lesion. After radiological evaluation, a biopsy was performed on the mass filling the external ear canal and the pathology report revealed a poorly differentiated carcinoma of the temporal bone, the histology of which was consistent with the previous stomach adenocarcinoma (figure 4a, b). Technetium-99m methylene diphosphonate (Tc-99m MDP) whole body scintigraphy showed increased uptake in the right mastoid bone and in column of the left femur (figure 5). Systemic chemotherapy and local radiotherapy to the metastatic temporal region was administered as a palliative treatment but he died two months after the diagnosis.

DISCUSSION

Metastatic involvement of the temporal bone by distant malignant tumors is rare.[1,2] On the other hand, some authors believe that the real prevalence of the temporal bone metastasis is much higher than suggested in the literature, because postmortem histologic evaluation of the temporal bones of patients who had died of malignancy is not performed routinely.[2,6,7]

There are five distinct routes of metastasis from the primary tumor to the temporal bone; hematogenous spread, direct extension, cerebrospinal fluid dissemination, leptomeningeal extension and leukemic or lymphomatous infiltration.[2] Hematogenous spread is the most common route of metastasis and the petrous apex is the most commonly affected site within the temporal bone.[3,8] Patients with petrous apex metastasis usually become symptomatic very late in the disease process. Otologic symptoms such as periauricular swelling, otalgia and facial paralysis usually occur at the advanced stage of the primary tumor. For those reasons, diagnosis of temporal metastasis is often delayed and the patients

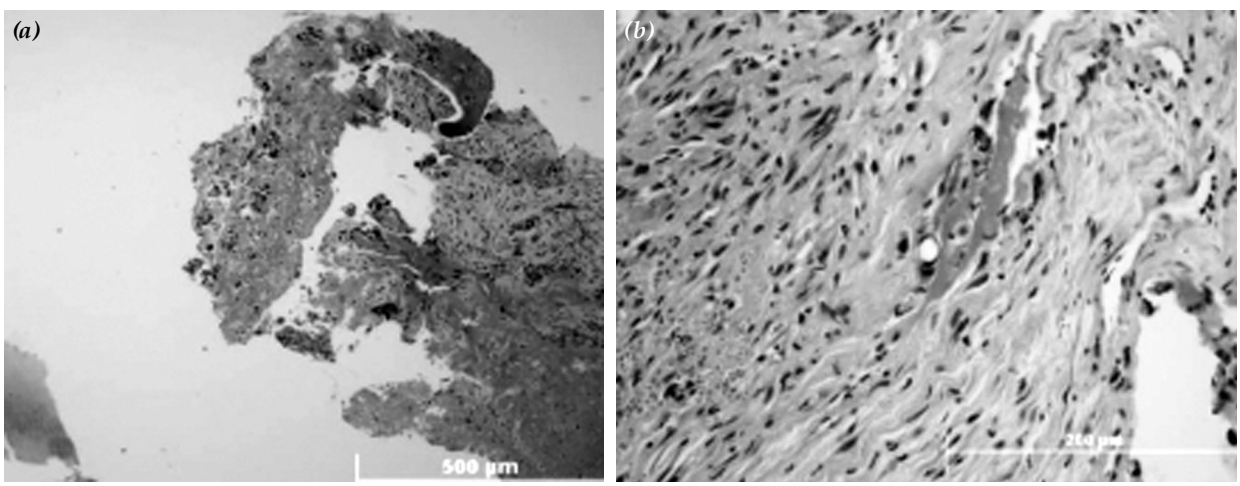

Figure 4. ***(a)*** *Pathologic examination of the mass filling the external ear canal. Necrotic bone fragments and the malignant epithelial cells are seen at a desmoplastic stroma (H-E x 100).* ***(b)*** *Pathologic examination of the stomach adenocarcinoma showing the malignant cells with signet-ring cell formation (H-E x 400).*

Figure 5. *Technetium-99m methylene diphosphonate whole body scan revealed increased uptake in the right mastoid and the column of left femur bones (arrows).*

invariably die within a short period of time.[9,10] Chemoradiotherapy can be used as a palliative treatment, unfortunately it has not shown to have any benefit on survival rates. Two of our cases with lung and stomach adenocarcinomas died two months after the diagnosis of metastasis, the other one with prostate adenocarcinoma died eight months later.

The widespread use of improved imaging techniques, especially CT and MRI, has led to an increase in the diagnosis of temporal bone tumors in recent years.[2] However, sometimes it may not be possible to determine whether a temporal bone tumor is primary or metastatic merely with imaging techniques. The definitive diagnosis can only be established by comparing the specimens from the primary and metastatic sites histologically. However, in patients with a history of proven primary tumor, especially with a tendency to metastasize to the bone, histologic confirmation is not considered necessary for the diagnosis of metastasis. In these cases, knowledge of a previous primary tumor and radiologic demonstration of temporal malignant tumor is considered sufficient for the diagnosis.[2,4] One of our patients (case 1) had a proven adenocarcinoma of the lung when she presented with multiple cranial nerve palsies. Computed tomography and MRI demonstrated metastatic tumor of temporal bone and the diagnosis was established clinically, based on the history of previous carcinoma and radiodiagnostics without the need to achieve histologic confirmation.

Some patients may not have a history of distant malignant primary neoplasm when the temporal bone tumor is detected. One of our patients (case 2) presented with nonspecific symptoms such as vertigo, hearing loss and otalgia and had no proven distant primary malignancy at the time of presentation. However, the tumor in the petrous apex was detected by CT and MRI and biopsy of the lesion revealed a carcinoma necessitating a search for a primary tumor. Elevated serum PSA level and prostate biopsy led to a final diagnosis of primary prostate adenocarcinoma.

This case emphasized that when a malignant lesion is detected in radiologic images of the temporal bone, a probable metastasis from a distant primary should be considered even in a patient with no history of a previously diagnosed primary malignancy. Complete physical examination and radiologic studies of distant sites with a tendency to metastasize to the temporal bone should be performed and serum PSA levels should also be determined to find the primary tumor.

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