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Metastatic adenocarcinoma of the temporal bone

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Abstract
Metastatic carcinoma involving the temporal bone is extremely rare. A case is reported with an unusual presentation – recurrent episodes of acute mastoiditis. Mastoid exploration and biopsy established the diagnosis. We believe this to be the first reported case to present in this manner.

Key words: Temporal bone; Adenocarcinoma, metastasis

Introduction

Carcinoma involving the temporal bone is rare. The incidence of primary carcinoma of the temporal bone is estimated to be 1 in 20 000 cases of all aural disease (Furstenberg, 1924). The majority of temporal bone malignancies are primary and most authors report that metastatic tumours in the temporal bone are extremely rare. Of 110 cases of temporal bone malignancy presenting to the Mayo Clinic, 101 were primary and only nine were metastatic (Greer *et al.*, 1976). The most common primary tumour is squamous cell carinoma, followed by adenocarcinoma and sarcoma. Metastatic disease presenting in the temporal bone may occur from a wide variety of different sites, of which breast, lung, kidney, prostate and stomach are the commonest in decreasing order of frequency (Hill and Kohut, 1976; Nelson and Hinojosa, 1991).

We report a case of temporal bone metastatic adenocarcinoma of the breast presenting with recurrent episodes of acute mastoiditis.

Case report

A 68-year-old Caucasian women was admitted (via the Accident and Emergency Department) with left-sided hearing loss and a painful left post-auricular swelling of five days duration. She had experienced no otorrhoea. Four years previously, she had had a mucinous adenocarcinoma of the left breast treated by mastectomy and radiotherapy.

On examination, she was pyrexial and the left ear canal was inflamed. A warm, tender, fluctuant swelling was present over the left mastoid region. She had no nystagmus and the facial nerve was clinically intact. Tuning fork tests confirmed a left conductive hearing loss and this was supported by a pure tone audiogram showing a 20 dB air–bone gap on the affected side. Oblique mastoid X-ray views showed opacification of the left mastoid air cells. She was treated, as a case of acute mastoiditis, with a high dose of intravenous antibiotics and antibiotic ear drops. After the inflammation of the ear canal had settled down the left ear was examined under the microscope. The tympanic membrane was intact and a diagnostic myringotomy performed under local anaesthesia failed to yield any pus. She improved dramatically and was discharged six days later.

The patient was readmitted three months later with a recurrence of the left post-auricular swelling which again was treated as a further episode of acute mastoiditis. It responded promptly to intravenous antibiotics and she was discharged within a few days.

A further recurrence of the left-sided mastoid swelling

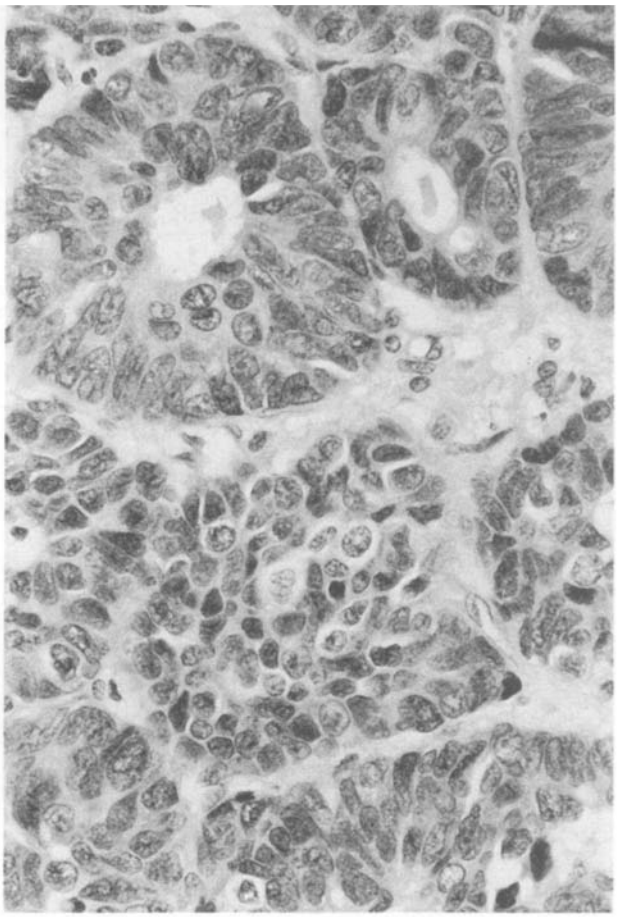

FIG. 1
Histological appearance of the metastatic adenocarcinoma in the temporal bone. The tumour has an acinar pattern and no mucinous foci are present. However, there are close cytological similarities with the previous primary breast carcinoma (Figure 2). (H & E; × 340).

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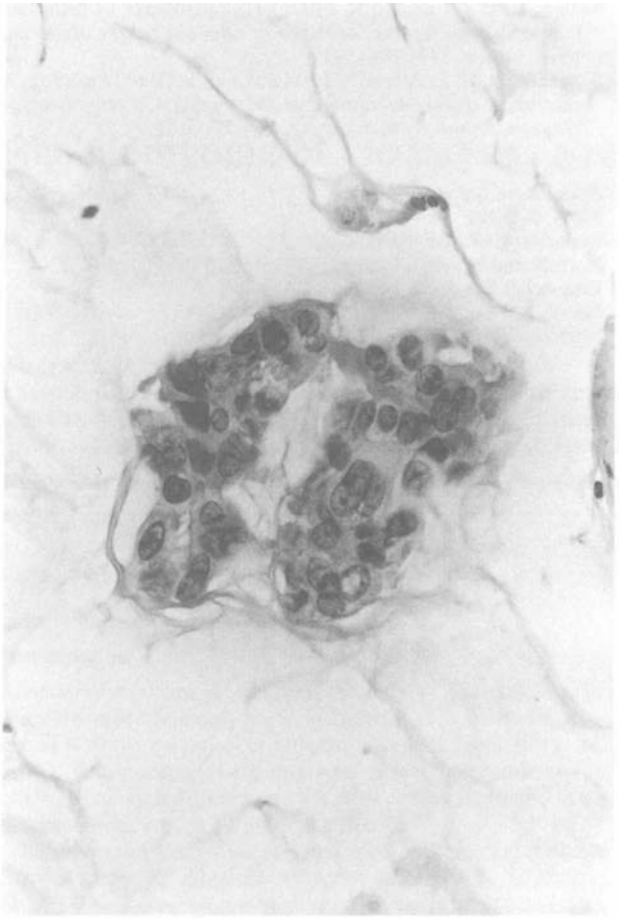

FIG. 2
Histological appearance of the primary mucinous adenocarcinoma of the breast removed four years previously. A cluster of malignant cells resembling those found in the temporal bone metastasis (Figure 1) is suspended in a large pool of extracellular mucin. A few tiny foci of typical invasive lobular carcinoma were present nearby (not shown). (H & E; × 340)

occurred six months later. By this time she was receiving radiotherapy for metastatic adenocarcinoma of the breast in the vertebral column. Examination revealed a warm, fluctuant swelling over the left mastoid region. In view of the past history, a mastoid exploration was performed. A soft tissue mass was found eroding the base of the skull and also involving the sternocleidomastoid and upper neck. Histological examination revealed this to be an adenocarcinoma (Figure 1). Although architecturally different from the primary mammary carcinoma (Figure 2), there were cytological similarities, suggesting that it was a metastasis from the breast tumour. A post-operative CT scan showed a massive, solitary metastasis extending from the upper neck, through the skull base and in close relation to the left cerebellar hemisphere (Figure 3). A course of radiotherapy was given and complete clinical resolution of the post-auricular swelling occurred. The patient remained symptom-free for five months after the course of radiotherapy, but succumbed to the disease without clinical recurrence of the temporal bone metastasis.

Discussion

Patients with temporal bone metastases can present with a wide variety of otologial symptoms. These often mimick chronic suppurative otitis media and such patients may present with any combination of the following: purulent otorrhoea, fluctuant post-auricular swelling, facial nerve paralysis, otalgia, deafness, vertigo and tinnitus (Jorgensen, 1961; Maddox, 1967). With such an array of symptoms and because of its rarity, the diagnosis is often

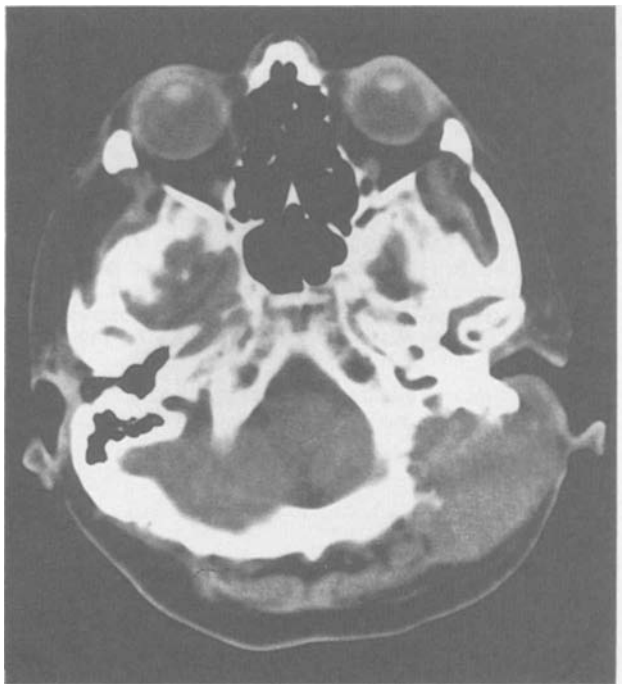

FIG. 3
CT scan showing a large soft tissue mass eroding the mastoid air-cell system with extension into the upper neck.

delayed. The mean duration of symptoms from onset to diagnosis has been reported to be 3.8 years (Greer *et al.*, 1976). Suspicion of malignancy is aroused from persistent facial nerve palsy, severe unremitting otalgia or blood-stained otorrhoea.

The most likely aetiology for the recurrent episodes of acute mastoiditis seen in this case is that the tumour in the temporal bone caused stagnant secretions in the mastoid air-cell system which allowed pathogenic bacteria to invade and produce an acute infection. Once each acute infection had been treated with antibiotics there were no residual signs to indicate malignancy.

Schucknecht *et al.* (1968) studied 10 patients with secondary malignant disease of the temporal bone. Most of these lesions involved the petrous apex and were extensive, involving the middle ear and mastoid regions, which may reflect the long time interval prior to diagnosis. The histological examination of these cases showed that although the metastatic lesion usually resembled the primary tumour it was often less differentiated.

Treatment is, therefore, often limited for tumours in this site. Initially, radical surgery was considered to offer the best chance of survival (Jaffee and Page, 1961). However, with advances in radiotherapy, the mainstay of treatment has become a combination of surgery followed by radiotherapy as soon as healing is complete (Birzgalis *et al.*, 1992). Even so, the prognosis for malignant disease of the temporal bone remains poor. Survival curves show that most patients succumb to their disease within two years of treatment. However, survival figures are significantly improved, if the 'early stage' of the disease is treated, to an 80 per cent five-year survival.

Conclusions

Similar presentations for mastoid temporal bone tumours and chronic suppurative otitis media often cause the diagnosis of malignancy to be delayed. In patients with recurrent episodes of acute mastoiditis, we advocate early surgical exploration, especially in patients of the cancer age group. Early diagnosis can only be made with a high index of suspicion.

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