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Case Report

Skull metastasis in urothelial cell carcinoma of the bladder

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ABSTRACT

Urothelial cell carcinoma of the urinary bladder with metastasis to the skull is extremely rare. We present a case of occipital bone metastasis arising from a previously verified bladder urothelial carcinoma. An 81-year-old woman presented with a painless, nonpulsatile mass in the left occipital region of the scalp that had progressively increased for 1 year. Skull radiography demonstrated a large osteolytic lesion in the left occipital bone. Computed tomography of the head showed a 6.5 cm × 6.0 cm skull defect from the midline to the left occipital bone, overlying the posterior superior sagittal sinus. The patient underwent a wide craniectomy with en bloc removal of the mass. Because of widespread disease, the patient died 3 months after surgery.

1. Introduction

Tumor metastasis to the skull occurs in various malignancies, most often from the lung, breast, prostate, and thyroid. Urothelial carcinoma of the urinary bladder (UCB) usually disseminates to the liver, lung, and bone marrow. Skull metastasis from UCB is uncommon, and occurs in less than 1.0% of patients harboring this pathology.

UCB is the fourth most common cancer in white men, with a male to female ratio of 8:1 in those older than 50 years [1]. Women and black people are most likely to present with advanced disease [2,3]. When distant metastasis is present, the disease becomes invasive with a poor outcome. A solid mass causing lytic lesions in the skull is suggestive of metastasis and can present with various radiological findings. Skull metastasis can cause many clinical manifestations including cosmetic problems, pain, local swelling, skin ulcerations, bleeding, neurological deficit, dural sinus compression, and sinus thrombosis.

Bone metastasis noticeably worsens the prognosis of cancer patients because of organ infiltration or progression of the original cancer. If cranial metastases overlie or invade the dural venous sinus, surgical resection may provide effective palliation of symptomatic skull metastasis. Focal palliative radiotherapy might also be helpful in relieving symptoms or preventing recurrence [4,5].

2. Case report

An 81-year-old woman presented to the Department of Neurosurgery, Chung Shan Medical University Hospital, Taichung, Taiwan, with painless, progressively increasing swelling in the left occipital region close to the midline of the scalp (Fig. 1A). High grade, lamina propria infiltrative UCB following transurethral resection (pT1N0M0, grade 1) had been diagnosed in this patient 1 year previously. After admission, skull radiography and contrast-enhanced computed tomography (CT) demonstrated a 6 cm × 6 cm × 6.5 cm lytic lesion in the left occipital bone destroying the outer and inner tables, and extending extradurally under the scalp (Fig. 1B and C). A total tumor resection via a left occipital craniectomy was performed. Grossly, the tumor was elastic and immobile with a thickened capsule and central necrosis, expanding intracranially and overlying the posterior superior sagittal sinus (Fig. 2). The entire tumor along with the involved bone was removed, and the portion overlying the sinus was gently

Conflicts of interest: none.

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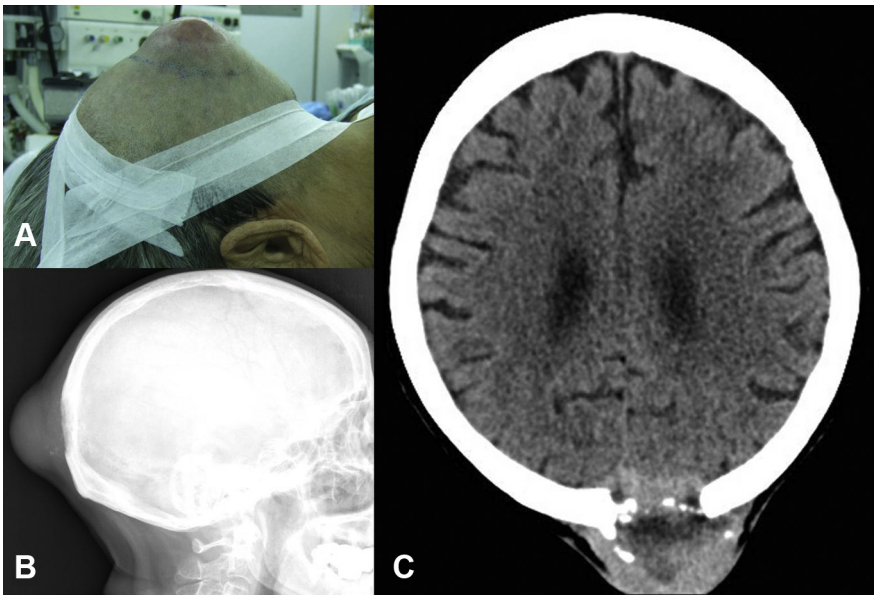

Fig. 1. (A) Lateral view of the head demonstrates a scalp mass. (B) Plain radiography of the skull depicts an osteolytic defect in the occipital bone. (C) Computed tomography reveals a defect in the left occipital bone and a soft mass compressed the superior sagittal sinus.

peeled away. Because there was no dural sinus involvement, en bloc resection of the tumor was accomplished with minimal blood loss. An acrylic plate was used for the bony defect. Histopathologic examination showed a papillary arrangement of cancer cells with central necrosis (Fig. 3A and B). The individual cancer cells showed pleomorphic nuclei and prominent nucleoli with frequent mitoses. The skull was infiltrated by cancer cells without involvement of the overlying dermis (Fig. 3C). Immunohistochemical stains with p63, CK20, and CK7 were all positive, thus confirming the diagnosis of metastatic urothelial cell carcinoma (Fig. 3D–F).

Three weeks after surgery, technetium-99m methylene diphosphonate (^{99m}Tc-MDP) bone scintigraphy showed abnormal ring-shaped uptake in the occipital skull related to postcraniectomy changes, but no other abnormal bone or vertebral uptake (Fig. 4). The occipital skull was the site of the initial distal metastasis originating from UCB. The patient had an uneventful recovery, and completed whole brain radiotherapy with 5040 Gy in 28 fractions. Because of refractory gastrointestinal bleeding and uremia, the patient died 3 months after the initial diagnosis of skull metastasis.

3. Discussion

The incidence of skull metastasis from malignant tumors is increasing, most commonly from breast cancer, pulmonary cancer, and prostate cancer. Breast cancer accounts for 55% of metastatic skull lesions, the highest rate of these cancers [6]. This report shows a rare case of skull metastatic urothelial cell carcinoma producing destruction of the left occipital bone. It also emphasizes an atypical appearance of urothelial cell carcinoma.

Skull metastasis from UCB is uncommon. Babaian et al [7] reported 107 cases of metastatic urothelial cell carcinoma; the most common site for metastases was the lymph nodes (78%), followed by the liver (38%), lung (36%), bone (27%), and adrenal glands (21%), with rare involvement (1–8%) of the heart, brain, kidney, spleen, pancreas, meninges, uterus, ovaries, prostate, and testes. Skull metastasis was found in only one case (1/107), accounting for less than 1% [7].

Skull metastases are classically osteolytic and hypervascular with an expansile palpable scalp mass, as in our case. In 2003, Stark

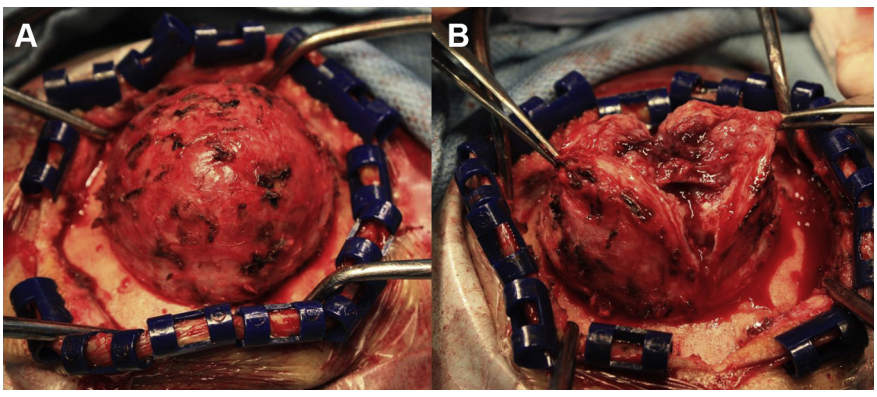

Fig. 2. Intraoperative photographs. (A) An elastic, immobile, occipital mass on the left side of the skull is seen. (B) The tumor capsule is thickened with central necrosis.