Recurrence Meningioma With Metastasis to the Skin Incision
—Case Report—

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Abstract

A 70-year-old woman presented with meningioma with metastasis to the skin incision. Neuroimaging demonstrated a tumor of the falx extending to the frontal bone. The tumor was grossly totally resected through a coronal skin incision. The histological diagnosis was meningotheliomatous meningioma. The tumor recurred in the ethmoid sinus 2 years later, and was resected through the transfacial approach. One year later, the tumor recurred in the ethmoid sinus and orbit, and was resected through the transcranial approach. Six months later, she noticed an isolated small mass under the skin incision, distant from a further recurrence of the tumor. Both tumors were resected. The histological diagnosis was atypical meningioma. Resection of atypical meningioma carries the risk of iatrogenic metastasis. Surgeons should wash out the operative field carefully and change surgical tools frequently.

Key words: meningioma, metastasis, skin incision

Introduction

Meningiomas are generally benign localized tumors. Extraneural metastases of meningiomas are rare,1) except from papillary and angioblastic meningiomas.3,4) The location of the primary tumor has limited significance in the occurrence of distant metastasis, although proximity to a major venous sinus may be a factor. The primary tumor may show some signs of malignancy, such as high cellularity, mitotic figures, necrosis, and invasion of underlying brain. A series of 85 metastases included 34 meningothelial meningiomas, 22 hemangiopericytomas, and five papillary meningiomas, but possibly also other tumors such as fibrosarcoma and histiocytic lymphoma. Metastases occurred most often in the lungs, liver, lymph nodes, bones, and pleura. Most patients with distant metastases also had local recurrences of the primary tumor. We report a case of atypical meningioma with metastasis to the previous skin incision.

Case Report

A 70-year-old woman noticed a protrusion on her head and went to a local hospital in 1996. Computed tomography and magnetic resonance imaging indicated a tumor of the falx and superior sagittal sinus that extended into the frontal bone (Fig. 1). The tumor was grossly totally resected through a...
Fig. 2 Photomicrograph of the resected specimen at the 1st operation revealing tumor cells septated by collagenous tissue. Tumor cells were largely uniform with oval nuclei, and without mitosis. HE stain, ×100.

Fig. 3 T1-weighted magnetic resonance image prior to the fourth operation showing a small subcutaneous mass beneath the previous skin incision (arrow), and recurrent tumor (arrowheads).

Fig. 4 Photomicrograph of the resected subcutaneous mass revealing high cellularity with some mitoses. These findings are similar to those of the locally recurrent tumor in the ethmoid sinus. HE stain, ×200.

Meningioma With Metastasis

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bifrontal craniotomy via a coronal skin incision. Part of the frontal bone was replaced with artificial bone. No tumor invasion into the scalp was observed, but tumor invasion into the mucosa of ethmoid sinus could not be denied. The patient received 40 Gy of focal irradiation. Histological examination of the resected tissue showed tumor cells septated by collagenous tissue. No mitosis was observed, and psammoma bodies were found in part of the tumor. The diagnosis was meningotheliomatous meningioma (Fig. 2). She suffered local tumor recurrence in the ethmoid sinus in 1998. This tumor was also resected through a transfacial approach.

The tumor recurred again in the ethmoid sinus and also extended into the orbit, so the patient was referred to our hospital in 1999. The tumor was resected through a transcranial approach using the previous coronal skin incision. The tumor was elastic hard and well demarcated. Histological examination showed high cellularity, some mitoses, and necrosis. Immunohistochemical examination showed that the tumor was positive for epithelial membrane antigen and negative for CD 34. About 8% of the tumor cells were positive for Ki-67. The diagnosis was atypical meningioma. Six months later, she noticed a small mass under the coronal skin incision distant from the original tumor (Fig. 3). She also had local tumor recurrence in the ethmoid sinus. Both tumors were resected through a transcranial approach using the coronal skin incision. The small tumor was located in the subcutaneous layer just beneath the skin incision. Histological examination of the tumors found similar findings of mitoses and necrosis. About 10% of the tumor cells were positive for Ki-67. The diagnoses were atypical meningioma (Fig. 4). Local recurrence appeared again in 2001. She underwent tumor resection and stereotactic radiotherapy to the tumor, which extended into the sphenoid sinus. Even after these treatments, the tumor extended into the optic canal, and she almost lost her vision. Four years after resection of the scalp metastatic tumor, no other distant metastasis has been found.

Discussion

Metastasis of meningioma is usually mediated by the transfer of tumor cells via the cerebrospinal fluid,
blood, or lymph. However, we suspect that the surgery mobilized some tumor cells in our patient, because the skin metastasis was localized just under the scar of the previous incision, and had no continuity with the original mass. No other tumor except local recurrence was recognized. Three other cases of suspected iatrogenic metastasis of meningioma have been reported in three women and one man, aged 11 to 73 years. The metastases were located in the temporal muscle, abdominal wall, and scalp, as in our case. The abdominal wall was the donor site for an autologous fat graft to pack the orbital defect after original tumor resection. The latency to metastasis was 5 months after resection of the original tumor. The latency to metastasis was 6 months in both cases of scalp tumor. These three cases were all atypical or anaplastic meningioma. The latency was 21 months in the other case, and the original and metastatic tumors were transitional meningioma without atypical features. The histological type may affect the latency to metastasis. No irradiation was performed before metastasis, except in the present case. Irradiation after the 1st operation may have induced malignant transformation of the original meningotheliomatous meningioma to atypical meningioma.

Surgical resection of atypical meningioma carries the risk of iatrogenic metastasis. The tumor tissue of our case showed 8% positivity for Ki-67, and had many mitotic cells. This tumor was highly invasive, and tended to spread like hemangiopericytoma and papillary meningioma. Neurosurgeons should be aware of the possibility of iatrogenic metastasis of meningioma, especially if the tumor has atypical features. Surgeons should wash out the operative field carefully and change surgical tools frequently.

References


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