Metastases of glioblastoma multiforme to cervical lymph nodes

Report of two cases


Departments of Neurosurgery and Pathology, and the Radiotherapy Unit, Ain-Shams University Hospital and Maadi Hospital, Cairo, Egypt

Two cases of occipital glioblastoma multiforme are reported in which a metastatic lesion involving the cervical lymph nodes on the side of the previous craniotomy was verified during life. This suggests to the authors that the brain tumor metastasized via lymphatic channels.

KEY WORDS - glioblastoma multiforme - extracranial metastasis - cervical lymph nodes

We are reporting two rare cases of glioblastoma multiforme that metastasized to the cervical lymph nodes. The diagnosis was made by lymph node biopsy.

Case Reports

Case 1

This 22-year-old man reported to the hospital on August 19, 1970, complaining of headaches, vomiting, blurring of vision, and diplopia of 3 weeks' duration. Neurological examination revealed left homonymous hemianopia, bilateral papilledema, paresis of the lateral recti oculis muscles more evident on the right side, and a left extensor plantar response.

Examination of the other body systems and plain radiographs of the skull and chest showed no abnormality. Right carotid angiography disclosed an occipital space-occupying lesion with evidence of abnormal circulation. On August 22, 1970, a glioblastoma multiforme (Fig. 1 left) was removed from the occipital lobe primarily by suction. Radiotherapy (total dose of 4000 rads) was given over a period of 4 weeks. The patient was discharged on September 30, 1970, with no signs or symptoms of increased intracranial tension. He was seen monthly in the out-patient clinic.

In March, 1971, he reported again with headaches and blurring of vision. Bilateral papilledema had returned. Nothing remarkable was detected at the site of the previous craniotomy. An enlarged firm nontender lymph node was noticed in the right side of the neck. An otolaryngologist could find no obvious source that might explain the nodal swelling. Careful examination of various organs of the body revealed no abnormality.
Case 1

Photomicrograph of tumor removed from the right occipital lobe, showing gliomatous appearance of cells and pleomorphism. H & E, X 270. Right: Section of the lymph node removed from the neck. The gliomatous tissue has almost completely replaced the original lymph node structure, leaving only the lymphoreticular bands. H & E, X 270.

There was no other lymph node enlargement. A full blood examination was normal.

Radiographs of the chest as well as a skeletal survey and careful investigations of all body systems showed nothing suggestive of a primary lesion, other than the brain tumor. The enlarged lymph node was excised; on microscopic study it showed a massive infiltration by gliomatous neoplastic cells similar to those seen in sections from the previously removed brain tumor (Fig. 1 right). A further course of radiotherapy (cobalt) was given to the brain in a dose of 1500 rads delivered over 2 weeks. No radiation therapy was given to the cervical region.

The patient was followed regularly in the outpatient clinic until February, 1972. Repeated examinations during the whole period showed no other lymph node enlargement or evidence of a primary lesion other than the brain tumor. Unfortunately, the patient was lost to follow-up afterward.

Case 2

This 35-year-old man came to hospital on January 28, 1971, complaining of headaches, vomiting, and blurring of vision of 10 days' duration. He had severe bilateral papilledema and right homonymous hemianopia. Plain x-ray films of the skull and chest were normal. Left carotid angiography showed evidence of a large occipital tumor which was grossly removed on February 1, 1971. Histological study of the tumor tissue revealed a glioblastoma multiforme (Fig. 2 left). Postoperative radiotherapy (deep x-ray) was started 2 weeks after operation; a total dose of 4000 rads was delivered over a period of 4 weeks. The headaches and papilledema subsided.

On September 24, 1971, the patient's symptoms recurred, and examination again revealed bilateral papilledema. Carotid angiography showed evidence of tumor recurrence, and on September 27, the occipital region was reexplored. The dura was adherent to the tumor, which was sucked
Glioblastoma metastasis to cervical lymph nodes

out and the involved parts of the dura excised. Histologically the tumor tissue proved to be identical to that previously removed at the first operation. There was evidence of infiltration of the dura by malignant cells but nothing to suggest invasion of the meningeal vessels. Postoperative recovery was uneventful. The patient was discharged on October 30, 1971, to be followed in the outpatient clinic.

On February 10, 1972, the patient came back with headaches. The bone flap was bulging slightly. A firm nontender enlarged lymph node was detected in the left cervical region. Careful search for a primary focus again revealed nothing suspicious other than the brain lesion. Excision biopsy of the affected node showed its invasion by glioma cells similar to those of the previously removed brain neoplasm (Fig. 2 center and right). A further course of radiotherapy (cobalt) was given to the brain (2000 rads/2 weeks). In addition, a course of deep x-ray therapy was applied to the neck (3000 rads/2 weeks).

While the patient was receiving radiation therapy, multiple firm nontender subcutaneous swellings were noticed in the left occipital region in the vicinity of the operative field. Excision biopsy of one of these swellings was suggested but the patient refused. A course of vincristine resulted in rapid disappearance of these subcutaneous lesions. When last seen in May, 1972, the patient was doing well.

Discussion

Brain tumors rarely metastasize outside the confinement of the skull and spinal canal. Some authors attribute the rarity of metastases of brain tumors to the absence of intracranial lymph channels, while others believe that brain tumor cells are unable to survive easily in other organs.

Metastases from glioblastoma multiforme are particularly rare. Ley, et al., (1961) were able to collect eight cases of glioblastoma multiforme among a total of 81 cases of intracranial tumors with extracranial meta-
stases reported in the literature. This is noteworthy considering the highly malignant character of this neoplasm. Extracranial metastases from brain tumors in the absence of craniotomy is distinctly rare. It is believed by many authors that craniotomy paves the way for the intracranial malignant cells to gain entrance to the extracranial blood vessels and lymphatics. Both of our cases had at least one craniotomy prior to the appearance of an involved lymph node.

Glioblastoma multiforme is unlikely to gain dural attachment in the absence of a previous operation. It is said that invasion of the intracranial blood vessels is unlikely even in the most malignant glioblastoma multiforme; however, some workers have reported evidence of this kind of invasion of the cerebral vessels as well as the dural vascular spaces, even in the absence of a previous craniotomy. Although dural attachment was evident in Case 2 at the second operation there was no evidence of invasion of the meningeal blood vessels by histological study.

Three main channels have been described as pathways for extracranial spread of brain tumors. These are the blood vessels, lymphatics, and artificial tubes used to divert the CSF pathway. We believe that the extracranial metastases in both of our cases had occurred through lymphatic channels to a lymph node draining the territory of the operative field and on the same side as the craniotomy. We also think that the subcutaneous swellings which appeared in Case 2 were metastatic deposits in the subcutaneous lymphatics adjacent to the area of the intracranial tumor; however, we have no confirmation on this point. The appearance of these metastases during radiotherapy and their disappearance following vincristine administration is noteworthy.

Some authors believe that patients with malignant brain tumors are unlikely to live long enough to develop remote metastases. It is noteworthy that the patient in Case 1 was still alive 18 months after the diagnosis of the primary highly malignant tumor and 11 months after the discovery of the lymph node metastasis. Although he showed no clinical evidence of other metastatic lesions, we would not be surprised to find them ultimately at autopsy.

It seems that the appearance of extracranial metastases from brain tumors does not necessarily herald either widespread dissemination or a short survival period.

References


Address reprint requests to: M. Salama, F.R.C.S., 8 Talat Harb Street, Cairo, Egypt.