Multiple primary tumors of the brain and bowel

Case report

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A 69-year-old man had two different primary neoplasms of the central nervous system and a third primary malignant neoplasm of the large bowel. Similarities and differences between this case and cases previously reported are discussed.

Key Words: multiple neoplasms, carcinoma of colon, meningioma, astrocytoma, carcinoma of bowel

The discovery of multiple primary neoplasms of the central nervous system is uncommon. In 1968 Fisher reported a case of a meningioma and a malignant glioma appearing in the same patient and in reviewing the literature found 33 cases of these two types of tumors in the same patient. Our case had two unrelated central nervous system neoplasms and a primary malignant tumor of the bowel.

Case Report

On February 15, 1968, a 69-year-old white man was admitted to the Latter-Day Saints Hospital in Salt Lake City, Utah, because of an episode of rectal bleeding.

First Admission. The patient was found to have a left frontoparietal lump grossly noticeable on the calvarium, measuring 7 x 9 cm in area and 1.5 cm thick. This had been present for approximately 20 years, growing progressively larger but not causing any particular problem. For approximately 6 months prior to hospitalization he had had progressive weakness and decreased coordination of the right arm and leg. He had been told this was caused by arthritis of the neck. The rectal bleeding was determined to be caused by carcinoma of the rectum diagnosed with a barium x-ray study of the colon and a sigmoidoscopic examination with a biopsy. Prior to bowel resection, carotid angiograms outlined a large left frontoparietal mass. A brain scan also indicated a large area of activity in this location (Fig. 1). He was discharged from the hospital 10 days following uncomplicated total removal of the rectal carcinoma (Fig. 2).

Second Admission. On March 25, 1968, the patient underwent a left frontoparietal craniotomy. A hyperostosing meningothelial meningioma was excised and a tantalum cranioplasty carried out at the same operation (Fig. 3). During the immediate postoperative period he had two focal seizures which were treated satisfactorily with Phenobarbitol and Dilantin. Following discharge he was given physical therapy for mild right
FIG. 1. Technetium-99 isotope encephalogram. Left: Anterior scan showing left frontal activity. Right: Left lateral scan showing abnormal uptake in the left frontal region, found to be a meningioma.

FIG. 2. Low-power photomicrograph of the rectal adenocarcinoma adjacent to normal-appearing mucous glands in the submucosa. H & E, ×125.

FIG. 3. Medium-power photomicrograph of the left frontoparietal meningioma showing characteristic whorls and psammoma bodies. No mitotic figures or malignant changes seen. H & E, ×125.
Multiple primary tumor

Fig. 4. Technetium-99 isotope encephalogram. Right: Anterior scan showing right parietal activity Left: Right lateral scan showing a focus of radioactivity in the right parietal region, found to be a malignant astrocytoma.

hemiparesis and after 4 months had regained total function of the right arm and leg. There was no residual neurological impairment.

Third Admission. On May 7, 1969, the patient was readmitted with a complaint of progressive loss of coordination in the left arm and leg over a period of 4 months. He also complained of “just not feeling right.” The electroencephalogram revealed a right temporal pretemporal slow focus. The brain scan showed a large lesion in the right parietal area (Fig. 4). The previous site of the meningioma in the left frontal area was void of any activity on the brain scan. Carotid angiography outlined a large mass lesion in the right parietal area. A right parietal craniotomy revealed a grayish-white partially cystic tumor which on pathological examination was determined to be a Grade III astrocytoma (Fig. 5). This was partially resected and an internal decompression of the tumor accomplished. Postoperatively the patient was somnolent and had a total left hemiplegia. Treatment with high energy radiation was withheld because of his poor condition. The patient did not improve despite aggressive steroid therapy and supportive care. He gradually deteriorated and died 2 months following surgery.

Fig. 5. Medium-power photomicrograph of a cellular astrocytic tumor of the right parietal region showing pleomorphism and vascular proliferation. Mitotic figures were present on high-power examination of the slide. H & E, x125.
Postmortem Examination. At autopsy no residual rectal carcinoma was found. No anomalies were found in the left frontal area at the site of the previously removed meningioma. Residual astrocytoma was found extending from the anterior region of the right parietal lobe to the mid-occipital lobe and associated with necrosis and cerebral edema.

Discussion
In Fisher's review, 33 cases of meningioma associated with gliomas were found. Fifteen of the meningiomas were malignant while the remaining 18 were benign. The gliomas and meningiomas occurred simultaneously with the exception of two cases. In 18 cases the tumors were in juxtaposition. In five cases the tumors were on the same side but not in juxtaposition, while in four cases the tumors were in opposite hemispheres. Tumor position in one case was not stated. Cooper recently reported a simultaneous occurrence of a meningioma and a malignant glioma again in juxtaposition similar to that in cases previously reported.

In our case no evidence of a right parietal lobe astrocytoma was found during the initial workup for the meningioma. The brain scan and angiogram failed to exhibit a rightsided neoplasm (Fig. 1). The tumors in this case were also in opposite hemispheres which, according to Fisher's review, occurs in a minority of cases. The presence of a third primary and unrelated malignant tumor of the bowel raises the question of tissue susceptibility or tendency toward metaplasia. It is interesting that the two malignant tumors did arise or were discovered approximately 1 year apart while the benign meningioma had been present for approximately 20 years. Russell and Rubinstein suggest that it is a coincidence when a meningioma and a glioma occur in the same patient since both are common central nervous system tumors. Those in juxtaposition, however, demand a different explanation. This question is still unanswered.

References

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