Multifocal glioma of the brain

Case report

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A case is presented in which two separate concurrent astrocytomas of the brain in the same patient were successfully operated on. The patient has been followed for 3 years and remains well. The authors believe that the diagnosis of multifocal tumors can be established on clinical grounds when the tumors are remote from each other, and when there has been no recurrence of neoplasm between the lesions after a long follow-up period. It is felt that a more optimistic approach to the treatment of multifocal tumors may yield good results.

KEY WORDS - bilateral brain tumors - astrocytoma - tumors, multifocal

BY DEFINITION, multifocal tumors are growths that originate and develop concurrently or consecutively at several points independently, without demonstrable direct continuity or evidence of metastases in between. This designation is based on pathological observations. We accept as multifocal tumors those that grow simultaneously but are remote from each other. The cases reported by Solomon and Perret, Russell and Rubinstein, and Zülch, fulfill the clinical criteria of multifocality. In addition, cases such as ours, in which functionally important nervous tissue intervening between the tumors remains asymptomatic for a prolonged period, should be considered multifocal from a clinical point of view.

In spite of the statistically unfavorable prognosis, the possibility of a benign course in some cases of multiple tumors should not be excluded. The patient we are reporting had clinical and laboratory signs of bilateral cerebral tumors and occult malignancy with metastatic brain involvement was suspected. Because of her young age and absence of a demonstrable primary lesion, we decided to operate. The tumors proved to be astrocytomas. Three years after operation, without chemotherapy or irradiation, the patient is functioning with few sequelae.

Case Report

This 25-year-old, right-handed music teacher was admitted on July 28, 1972, complaining of headache, trouble with the use of...
her right hand, and difficulty with walking of 2 weeks' duration. Three months prior to admission she had been delivered of a normal child after an uneventful pregnancy and parturition. Subsequently she suffered from acute mastitis that cleared entirely with antibiotic therapy.

Examination. Neurological examination revealed a rather apathetic and indifferent patient with slow cerebration. There was complete right-left and spatial disorientation, and right and left hemiparesis with dysesthesia on the right and hypesthesia on the left. No speech or visual defects were found and the optic fundi were normal. Due to the bilateral brain involvement, the possible diagnoses of multiple metastatic lesions, brain abscesses, and a corpus callosum tumor with butterfly extension were considered.

Skull films were normal. Repeated electroencephalographic (EEG) records showed consistent right frontoparietal focal signs. Repeated bilateral carotid angiography and pneumoencephalography demonstrated a right frontal parasagittal space-occupying lesion. Isotopic brain scans (Fig. 1) revealed two distinct foci of pathologically increased uptake: one frontal precoronal, parasagittal and suprasylvian on the right, and one parietal parasagittal on the left. Chest films and human chorionic gonadotropin levels were normal, and no melanin was found in the urine.

First Operation. On August 30, 1972, a right frontal craniotomy was performed. On exploration the corpus callosum looked macroscopically normal. Biopsy tissue from the angle between the corpus callosum and the cortex was normal, as were specimens from dorsolateral and interhemispheric cortex. An incision was made on the upper dorsolateral aspect of the premotor area, and a tumor was subtotally resected by intratumoral suction. The lesion was poorly limited and appeared to be formed by two distinct nodules in the upper frontal and suprasylvian areas with pathological tissue in between.

Histological Examination. Histologically the tumor proved to be an astrocytoma composed of well-differentiated fibrillary astrocytes mixed with a large number of gemistocytes in several areas (Fig. 2 left). There were edematous zones in some fields of the histological sections. There was no evidence of pleomorphism or peculiar vascular changes. In the edematous areas, small groups of scavenger cells could be detected.

First Postoperative Course. Postoperatively the patient improved rapidly and her
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FIG. 2. Photomicrographs of the tumor specimens. H & E, X 100. Left: First operation. The tumor is composed predominantly of gemistocytes mixed with a small number of fibrillary astrocytes. Right: Second operation. This astrocytoma specimen is similar to that from the first operation.

left-sided neurological deficit receded. After 1 week, however, her condition deteriorated; her headache and right hemiparesis increased, and bilateral papilledema was observed for the first time.

Second Operation. On September 20, 1972, the left parietal region was explored. The cortex appeared normal; a subcortical tumor was exposed and subtotally resected by intra-tumoral suction.

Histological Examination. Sections of the tumor were histologically very similar in structure to those of the first tumor removed from the opposite hemisphere (Fig. 2 right). In neither operation was the ventricle reached.

Second Postoperative Course. The patient made an uneventful recovery from both operations. She has been followed for 3 years. She returned to her village where she now works part-time in the tailor shop. She manages better with her left hand than her right, especially when typewriting. She cannot play the piano any more because she is unable to find the correct keys with her right hand. She has had several convulsive seizures, grand mal and right Jacksonian, although she is taking regular anticonvulsive medication. The latest EEG record on January 5, 1975, showed slight slowing in the right frontal area. A follow-up isotopic brain scan on October 9, 1975, showed increased peripheral uptake on both sides (Fig. 3), as expected after bilateral craniotomies; none of the preoperative abnormal uptake was seen. A thorough search for signs of hamartomas of skin or optic fundi, as seen in Bourneville’s disease, proved negative.

Discussion

Although we have no histologically irrefutable proof of the absence of direct continuity between the two tumors, as required by pathologists in order to rule out regional metastases or satellite formation, we consider this to be a case of multifocal tumor. It seems unlikely that continuity should exist between a right premotor frontal tumor and a left retromotor parietal tumor in a patient who, 3 years after a subtotal resection without complementary chemo- or radiotherapeutic treatment, remains well and without motor complaints.

Zülch’s postulates that some areas of the brain may be less favorable for tumor growth than others. Had there been any tumoral bridge between the two neoplasms at the time of the operations, as in Case 1 of Batzdorf and Malamud, signs of recurrence would be expected by now.
The negative exploration of the corpus callosum, the absence of cortical infiltration by the tumors, and the fact that they did not reach the ventricles, favor multifocality. As in the cases of Batzdorf and Malamud, our patient's condition deteriorated grossly after the first operation. We think that in similar cases one should be prepared to tackle both lesions within a short time. Finally, it is considered that the preceding pregnancy did not influence the clinical appearance of the tumor, nor that the end of that pregnancy contributed to the good postoperative result.

References

11. Zülch KJ, cited in references 3, 6 and 9

This paper is dedicated to the memory of Dr. Gideon Manelis who gave his life in the service of medicine.

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