Subependymoma presenting as subarachnoid hemorrhage

Case report

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Symptomatic subarachnoid hemorrhage (SAH) in a young patient originated in a non-obstructive lateral ventricular subependymoma. A brief review of brain tumors known to cause SAH is discussed. The computerized tomography scans are presented.

KEY WORDS  •  brain tumor  •  subependymoma  •  subarachnoid hemorrhage  •  computerized tomography

Spontaneous subarachnoid hemorrhage (SAH) with presenting symptoms of sudden, severe headache, papilledema, and neck stiffness usually indicates bleeding from an arterial aneurysm, hypertensive arteriosclerotic vascular disease, or a vascular malformation. Occasionally, a brain tumor can also produce symptomatic SAH.

Subependymoma is a rare, benign neoplasm occurring in the recesses of the fourth ventricle and occasionally in the lateral ventricles. Symptoms, if any, usually result either from direct compression of the brain stem or from acute hydrocephalus due to occlusion of the foramen of Monro or aqueduct of Sylvius. We report an unusual presentation of a lateral ventricle subependymoma in a young male patient.

Case Report

This 16-year-old right-handed boy was well until 3 days before admission, when he was awakened with a severe headache and blurred vision. He subsequently developed tinnitus, diplopia on distant gaze, a stiff neck, and nausea and vomiting.

Examination. He presented to the emergency room, where a lumbar puncture demonstrated an opening pressure greater than 400 mm Hg. The cerebrospinal fluid was grossly bloody, with 10,000 erythrocytes, 100 leukocytes (80% lymphocytes and 20% neutrophils), and marked xanthochromia. Concentrations of protein and glucose were 28 mg% and 60 mg%, respectively.

The patient's neurological status on admission included normally reactive, asymmetrical pupils (right 3 mm, left 2 mm), mild left hand drift, and left inferior incongruous quadrantanopsia. Computerized tomography (CT) showed an enhancing mass filling the atrium of the right lateral ventricle (Fig. 1). Angiography demonstrated no tumor vessels.

Operation. At surgery, a right parieto-occipital craniotomy was performed. The parasagittal parietal lobule approach to the lateral ventricle revealed a tumor 3 cm below the pial surface. Gross total excision of firm tan avascular tumor, measuring 7 cm in aggregate diameter, was carried out. The tumor was fairly well demarcated from surrounding brain, and extended partially into the ventricle. Light microscopic examination of the tissue showed a sparsely cellular neoplasm with an eosinophilic fibrillar matrix and nests of round to oval nuclei (Fig. 2). Portions of the tumor showed microcystic change within the fibrillar net-
work. There were several foci of hemosiderin-laden macrophages admixed with recent hemorrhage. Much of the tumor showed abundant eosinophilic edema.

Postoperative Course. The patient's postoperative course was marked by a nearly complete left homonymous hemianopsia. On discharge, no further neurological deficits were noted. No radiation therapy was administered.

Discussion

Brain tumors per se are an infrequent cause of SAH. In the Cooperative Study, only 28 of 5836 patients with SAH had brain tumors. Of these, 12 were primary, 12 were metastatic, and four were presumed metastatic. The primary tumors included three glioblastomas multiforme, one ependymoblastoma, one oligodendroglioma, two unspecified primary cerebral tumors, one parasagittal meningioma, one choroid plexus papilloma, one hemangiosarcoma, and one chromophobe adenoma. Metastatic tumors included five melanomas, four lung cancers, and perhaps two metastases from cancer of the colon and two from breast cancer.

Walton discussed rare causes of SAH including brain tumors. Low-grade glioma was rarely associated with “profuse subarachnoid hemorrhage,” but metastatic tumors were. Malignant melanomas, whether primary or metastatic, “may give rise to subarachnoid bleeding so sudden as to cause confusion with aneurysmal rupture.” There was evidence of SAH in 26 of 56 cases of malignant melanoma. Pituitary adenomatous apoplexy was also frequently associated with SAH.

Four of 56 cases of spontaneous SAH in children were caused by tumor: malignant astrocytoma, medulloblastoma, choroid plexus papilloma, and neuroblastoma. Both choroid plexus papilloma and hemangioma may bleed. Pineocytomas have presented as SAH. Isolated reports concerning acoustic neurinomas have been linked to SAH. Kasantikul and Netsky suggested that portions of acoustic neurinomas may have abnormal blood vessels as the basis
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for the predilection to SAH. Rarely, SAH has been associated with intraspinal tumors such as neurofibroma, astrocytoma, ependymoma, and neurilemmomas.

The present case affords an opportunity to observe the characteristics of the tumor on CT scanning. It was initially isodense with brain and showed marked enhancement after contrast infusion. Only two examples have previously been studied by CT; both of these were approximately isodense on plain CT, but the effect of enhancement was not described. There was an unexplained discrepancy between the CT appearance and the operative findings. At surgery, the tumor appeared to have a clearly demarcated boundary, but the CT appearance suggested an infiltrating, irregular mass.

In Scheithauer's series of symptomatic lateral ventricular subependymomas, one of the six patients who did not undergo surgery died as a result of massive hemorrhage into a large subependymoma. Furthermore, many of the symptomatic subependymomas were large and characterized by intraparenchymal hemorrhage. The present tumor also showed evidence of recent and old hemorrhage.

The association of a tumor with SAH does not necessarily indicate the presence of a malignant tumor, even with the CT appearance suggesting an infiltrative lesion. Rather, the presence of subarachnoid blood may herald a life-threatening intracranial hemorrhage and justifies rapid neurosurgical intervention.

References