An Intracranial Arterial Aneurysm Associated with a Recurrent Meningioma

Report of a Case

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A recurrent meningioma associated with an intracranial aneurysm, such as that described here, appears to be unique. Review of the literature, from Dandy’s classic monograph in 1925 on intracranial aneurysms in 1947 to the present, failed to reveal a report of such a lesion. Nor did Cushing and Eisenhardt, in their monograph on meningiomas published in 1938, indicate that an aneurysm had complicated any of the many recurrent meningiomas in their vast experience.

Bleeding aneurysm as a consequence of the removal of a primary tumor is, on the contrary, well known. Hemorrhage from such an aneurysm was reported by Finkemeyer in 1955. Some 17 days after the removal of a right frontal meningioma, an intracranial hemorrhage occurred during the act of straining at stool. Postoperative angiography revealed a “pea-sized” saccular aneurysm of the middle cerebral artery, close to the site of application of a silver clip. The author considered this to be a false aneurysm. The application of a second silver clip to the neck of the sac resulted in the patient’s recovery. Taylor, in 1961, found reports of 7 cases in the literature of the previous 65 years, and analyzed 8 unreported cases from the files of the Atkinson Morley's Hospital, Wimbledon, and the National Hospital, Queen Square, London, which, with the addition of a patient observed by him, totaled 9 cases of intracranial aneurysm associated with primary tumor. In 2 of the 9 patients, bleeding occurred preoperatively; in 3, postoperatively. In 1, the aneurysm bled but no operation was performed; and in 3 no bleeding occurred. Eight of the 9 aneurysms were considered to be “developmental” in origin; the origin of 1 was “uncertain”. The decompression resulting from removal of the tumor was considered in some way to be a factor accelerating aneurysmal dilatation and early hemorrhage from a pre-existing developmental lesion. Boldrey observed a ruptured aneurysm in a patient who had had a previous operation for meningioma. The patient died of subarachnoid hemorrhage. The amount of recurrent meningioma was not significant.

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Case Report

A 44-year-old white man was admitted to the Neurological Service of Kaiser Foundation Hospital, Oakland, complaining of frequent episodes of dizziness, headache, and nausea throughout the previous 3 or 4 months. Numbness and tingling of the left arm had occurred episodically, independently of the headache. Transient blindness of the left eye and staggering to the right, usually following the episodes of numbness and tingling in the left upper extremity and lasting for several minutes, had occurred as often as 3 or 4 times daily within the past several weeks. The patient had not fallen to the ground. There were no tonic or clonic movements of limbs, loss of sphincter control, or other evidence of a major seizure. Resection of a “malignancy” of the sacrum had been performed elsewhere in 1937, but the tissue was not available to us for review.

Examination. On admission the patient appeared healthy and was in no pain or distress. The only significant abnormalities found on thorough physical and neurological examination were a well-healed scar over the sacrum, and bilateral papilledema. There was nothing about the sacrum to indicate recurrence of neoplastic activity. Roentgenograms of the chest, skull, and sacrum showed nothing unusual.

Bilateral carotid angiograms on the day after admission revealed vascular displacement and the tumor mass (Fig. 1). The vessel loop visible on the lateral view illustrated (arrow) was not considered significant.

Operation. Left frontal craniotomy was performed under general anesthesia the day after admission. A large parasagittal meningioma was encountered and resected, with the difficulties usually attendant on the removal of these tumors. A small amount of tumor was removed with the electric loop to obtain working space. The plane of demarcation from the brain was distinct. The tumor was firmly attached to the dura. The site of attachment was thoroughly fulgurated with the electro-surgical unit after the mass had been resected. During the operation, which lasted approximately 8 hours, the patient received intravenously 6 units of citrated whole blood. The lowest blood pressure, 80/40, lasted for approximately 35 minutes. At the time of closure, the blood pressure stabilized nicely at the preoperative level (110/70). Review of the operative notes and of the postoperative skull roentgenograms disclosed no unusual hemorrhage, and no applications of silver clips at the site of subsequent aneurysm formation. Histologic examination of the tumor revealed it to be a meningioma (Fig. 2).

Postoperative course. The patient tolerated the procedure well except for a temperature of 104°F. on
the first postoperative day. After the 3rd postoperative
day recovery was rapid. The wound healed by primary
union. The patient was discharged alert, cooperative
and with no neurological deficit, on the 6th postopera-
tive day. The papilledema was essentially unchanged.
After a year, during which the patient was under
observation by his local physician, he returned to the
neurosurgical outpatient department. Neurological
examination showed no abnormality. There was no
papilledema. The bone flap was not “riding.” There was
no evidence of recurrence of the meningioma.

Twenty months after craniotomy, the patient again
came to the neurosurgical outpatient department, this
time complaining of left frontal headache and nausea
without vomiting. His daughter reported personality

changes within recent months. The only abnormality
found on neurological examination was early papil-
ledema, approximately equal bilaterally. Plain roent-
genograms of the skull showed alterations in the posi-
tions of the silver clips. The patient was readmitted to
the hospital for angiography. Electroencephalogram
showed a slow wave focus of medium voltage in the
left frontal region, with some spread to the right
frontal and left anterior temporal regions.

2nd Operation. Angiography showed recurrence of the
left frontal tumor and the first appearance of a left
frontal aneurysm. Immediately after angiography (Fig.
3) the old craniotomy site was reopened. The aneurysm
arose from the frontopolar artery on the left side. It was
readily visualized after the recurrent tumor mass had
been delivered. The meningioma and the concomitant
aneurysm which lay anterior and inferior to it, were
removed without the use of hypothermia. Review of
the previous operative note indicates that this artery
was not visualized during the initial procedure for
tumor removal.

During the 2nd operation, which lasted 3 hours and
40 minutes, the patient received 6 units of blood to
cover estimated loss. He tolerated the operation well,
and was discharged 7 days later ambulatory, in good
condition, with no abnormal neurological signs except
for unchanged papilledema. He was given diphenyl-
hydrantoin, 300 mg. daily. Histologic study of the tumor
again confirmed the diagnosis of meningioma. The
aneurysm was also examined, but no conclusion was
reached as to its origin (Figs. 4, 5).

When seen in the neurosurgical outpatient depart-