Case Reports and Technical Note

Giant Aneurysm of the Posterior Cerebral Artery*

Case Report

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It is well known that some intracranial aneurysms, having attained a large size without rupturing, may act as space-occupying lesions. Dandy, in his review of large aneurysms of the posterior cerebral artery reported at autopsy, concluded that “the aneurysms of the posterior cerebral artery are usually quite large, and are indistinguishable from neoplasms in the same region.” He believed that they could have been clipped and removed after occipital lobectomy, and he quoted one case successfully treated by German in 1938.

We are reporting an enormous unruptured aneurysm of the posterior cerebral artery.

Case History

E. P. A., a 20-year-old girl, was admitted because of failing vision for 1 year and ab-

normal sensations of smell for 2 years. There had been no headaches.

Examination. The patient was practically blind, with bilateral secondary optic atrophy. Vision was reduced to distinguishing light and the movement of large objects. No other obvious findings were disclosed by the neurological examination, except for a slight loss of postural tone in the left arm, with a doubtful disturbance in the movements of the same arm. All routine laboratory studies were normal. The electroencephalogram showed delta waves in the posterior part of the right hemisphere.

Angiography. The sella was enlarged and showed erosion of the dorsum and posterior clinoids due to increased intracranial pressure. Left carotid angiography showed only a stretching of the vessels, indicating a moderate degree of ventricular dilatation. Right carotid angiography demonstrated the large vascular mass of a giant aneurysm with an irregular sac (about 5×8 cm) located in the

Fig. 1. Giant aneurysm of the posterior cerebral artery visualized by right lateral and anteroposterior carotid angiography.
temporoparieto-occipital region. In the lower part of the sac another irregular dilatation extended towards the midline and was surrounded by blood vessels (Fig. 1). The filling of the aneurysm was not uniform during the first exposures, but later it was complete and persisted after the filling of the vascular tree had practically disappeared, indicating a slower circulation through the sac of the aneurysm. The main vascular supply to the large sac came from the posterior cerebral artery, which was enlarged and arose directly from the carotid through a dilated posterior-communicating artery that was practically the same size as the internal carotid. The venous drainage of this enormous vascular lesion was through the deep venous system to the veins of Galen and sinus rectus. Left vertebral angiography by direct percutaneous puncture showed the same image and filling of the aneurysm through a large posterior-cerebral artery (Fig. 2).

Iodoventriculography, using emulsif
lipidol, showed the ventricular system to be markedly displaced towards the left by a large space-occupying lesion of the right hemisphere, which also produced a filling defect in the posterior part of the third ventricle (Fig. 3).

Operation. Several days later, a large osteoplastic flap was elevated to expose the posterior part of the right cerebral hemisphere. The dura was tense. Controlled respiration with negative pressure was carried out, and the arterial blood pressure was reduced to 70 mm Hg with intravenous Arphonad. A partial occipital lobectomy and the coagulation of some large vessels in the temporal region gave access to the large sac of the aneurysm, which was easily dissected from the surrounding cerebral tissue. The wall was rather thick and resistant, with some irregular lobulations at the base of the main sac, and pulsation was easily felt in the whole sac. During the dissection, a small hole was opened in the anterior and inferior part of the sac and a large flow of blood invaded the operative field. This opening was quickly occluded with the finger. A very rapid dissection of the inferior portion of the sac was carried out until the dilated posterior-cerebral artery was exposed and obliterated with a clip. Immediately, the pressure within the sac was reduced, and the aneurysm collapsed. After dissection and obliteration of the blood vessels at its base, the aneurysm was completely removed. Hemostasis was established. The dura was closed and the bone flap replaced routinely.

The condition of the patient during the operation was good. Blood pressure varied between 70 to 100 mm Hg. Arphonad was injected for about 40 minutes, and nearly 3 liters of blood was transfused during and after the operation.

Fig. 5. Carotid angiography after the removal of the giant aneurysm.
Pathological Study. The mass was a giant saccular aneurysm with a large main sac and several others of smaller and irregular size (Fig. 4). The inside of the sac was partially filled with blood, and some areas of the wall appeared thicker and with some degree of organization. In the lower portion of the sac, there were several small openings in communication with the posterior cerebral artery and with the lobular protrusions at the base of the aneurysm.

Microscopic study confirmed the diagnosis of an arterial aneurysm with a wall formed mainly by altered connective tissue and some fascicles of muscular fibers, and organization and granulation in the more internal layers.

Postoperative Course. The patient recovered consciousness and was in good condition. During the first 2 weeks, moderate left hemiparesis was present, but disappeared. The only residual postoperative neurological defect was astereognosis in the left hand. At follow-up, right-carotid angiography showed no abnormality (Fig. 5). Circulation had improved, and there was much better filling in the territory of the anterior cerebral artery.

Summary
We have reported the successful diagnosis and removal of a very large unruptured arterial aneurysm located in the posterior part of the right cerebral hemisphere, and supplied by the posterior cerebral artery.

References
2. German, W. J. Quoted by Dandy. (See ref. 1).