Traumatic Aneurysm of the Anterior Choroidal Artery

Case Report

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Blackwood6 classifies intracranial aneurysms as follows: (1) congenital, (2) mycotic, (3) arteriosclerotic and (4) post-traumatic and spontaneous. Carotid cavernous fistulas which are really not aneurysms generally comprise the fourth category. Recently Paillas et al.3 have described the traumatic production of an aneurysm proven by arteriography of the middle meningeal artery. Goald and Ronderos4 have reported a case of perforation of the intracranial internal carotid artery by a piece of a steel spring resulting in a traumatic aneurysm. A case history of a patient with a traumatic aneurysm of the anterior choroidal artery documented by angiograms and postmortem photographs follows.

Case History

This 34-year-old man who had no history of headaches or previous subarachnoid hemorrhage impaled himself through the left eye with a jeep radio antenna at approximately 8:30 p.m. on November 9, 1964. He was taken to the nearest city hospital where neurological examination demonstrated semicoma with right hemiplegia, including a right central 7th nerve weakness. A left Achilles and left Babinski sign were the only reflexes present. The left globe was collapsed. A left carotid arteriogram was performed and was interpreted as normal (Fig. 1). Conservative therapy was adopted in the absence of any indication for surgery. On November 18, 1964, with the neurological condition stable, an evisceration of the left eye was performed and a plastic prosthesis implanted. The surgeon noted that the antenna had penetrated the cranial vault through the posterior aspect of the orbit. The patient was then transferred to Walter Reed General Hospital for further therapy.

Examination. On admission his temperature was 102.4°F rectally, with a pulse of 104. Neurological findings were unchanged from the time of injury. The left anophthalmos was noted. Diffuse rhonchi and rales were present bilaterally. The diagnoses on admission were:

(1) Penetrating left orbital cranial wound with severe damage to the left anterior perforated substance and left mesencephalic peduncle, and
(2) left surgical anophthalmos.

Lumbar puncture demonstrated xanthochromic fluid with an opening pressure of 138 mm. of water. Spinal fluid studies revealed a sugar of 54 mg, per cent, total protein of 111 mg. per cent, 72 leukocytes per cubic mm., 20 per cent poly-morphonuclear leukocytes and 80 per cent lymphocytes; the culture was sterile. Skull x-rays showed no fractures. The chest x-ray was normal except for a trachecostomy tube.

Course. He was treated with penicillin and chloromycetin in order to combat a possible orbital infection, meningitis and pneumonia. The patient developed a constant fever of 101° for the first 5 days. After thorough evaluation it was felt that another angiogram was indicated to see if any alteration in the blood supply to the anterior perforated substance could be shown. Fifteen days after the injury a left carotid arteriogram was performed which demonstrated a traumatic aneurysm of the left anterior choroidal artery (Fig. 2). On the same day the patient had a moderate upper gastrointestinal hemorrhage. His neurological status remained unchanged except for the development of bilateral Babin-
Fig. 2. Left carotid arteriogram performed fifteen (15) days after injury clearly demonstrating an aneurysm of the anterior choroidal artery. The apparent aneurysm of the A-2 segment (left) was demonstrated to be factitious by other arteriographic views and autopsy.

...ski responses. Two days later at 8:15 a.m. he developed a fever of 105°. The hematocrit was 27 per cent. He was placed on a hypothermia refrigeration mattress to maintain a normal temperature range. Chest x-ray at this time demonstrated no evidence of pneumonia although he had decreased breath sounds over the left chest. He died suddenly at 9:20 a.m.

Autopsy. The brain was moderately swollen with subarachnoid blood over the surface of the cerebral hemisphere and in the basilar cisterns. An irregular laceration measuring 1 cm. in length and 3 mm. in width surrounded by a 1 cm. contusion was noted in the left uncus and anterior perforated substance. The damage extended into the lateral half of the left basis pedunculi with contusion of the tegmentum of the midbrain (Fig. 3). Horizontal sections of the brain demonstrated a recent intracerebral hematoma 3X5X5 cm. destroying the posterior third of the left putamen, globus pallidus and thalamus and extending into the white matter of the the left parietal lobe and internal capsule, and into the left lateral ventricle where it formed a ventricular cast (Fig. 4). The apparent origin of the hematoma was in

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Fig. 3. Photograph of the base of the brain at autopsy demonstrating destruction, contusion and hemorrhage of the left anterior perforated substance and the left side of the midbrain.

Fig. 4. Horizontal section of the brain demonstrating a large intracerebral hematoma with intraventricular hemorrhage.
the region of the anterior choroidal aneurysm although the artery and aneurysm could not be demonstrated because of severe tissue destruction. Transverse sections of the brain stem and cerebellum demonstrated a laceration and associated hemorrhage of the left basis pedunculi and mesencephalic tegmentum which appeared to be the result of the initial trauma.

Discussion

The destruction of the left uncus, left anterior perforated space and left basis pedunculi with hemorrhage into the tegmentum was the direct result of penetration by the radio antenna. The antenna damaged the wall of the anterior choroidal artery which resulted in an aneurysm as blood continued to flow through under normal pressure. It is inconceivable that the cerebral substance could provide a buttress strong enough to allow formation of a false aneurysm. The carotid arteriogram performed on November 24, 1964 (Fig. 2), unequivocally demonstrated the presence of an aneurysm. In retrospect, this aneurysm can be observed in its earliest phases of development on the initial carotid arteriogram (Fig. 1). The two angiograms graphically illustrate the formation of a traumatic aneurysm which subsequently ruptured causing an extensive intracerebral, intraventricular hemorrhage and resulted in death.

Summary

We have related the clinical history of a patient in whom an anterior choroidal artery aneurysm resulted from a penetrating orbital cranial wound. The lesion was identified angiographically and examined at autopsy.

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References