Aneurysm of the Pericallosal Artery Caused by Closed Cranial Trauma

Case Report

KENNETH R. SMITH, JR., M.D., AND JOSEPH A. BARDENHEIER, III, M.D.
Section of Neurological Surgery, Department of Surgery, Saint Louis University
School of Medicine, Saint Louis, Missouri

Several instances of traumatic intracranial arterial aneurysm after penetrating injury or fracture adjacent to the internal carotid or middle meningeal arteries have been reported. The development within a few days or weeks after closed cranial trauma of an aneurysm on an artery shown to be free of aneurysmal dilatation immediately following the injury has rarely been documented, and must certainly be an unusual occurrence. We have recently performed serial carotid arteriograms on such a patient and have observed the development of an apparently traumatic aneurysm of the right pericallosal artery.

Case Report

A 21-year-old man was admitted to Saint Louis City Hospital on October 15, 1967, shortly after an automobile accident in which he had been struck on the head.

Examination. The patient was unconscious, with rigidity of the legs and bilateral extensor toe signs. He moved the left leg less than the right. A right carotid arteriogram performed on the day after admission (Fig. 1) disclosed no abnormality except minimal bowing of the pericallosal artery from left to right.

It was thought that the patient had bilateral cerebral contusion with more swelling on the left. He was treated with osmotic diuretics and Decadron, and regained consciousness after 4 days. He had no dysphasia or weakness of the arms but showed persistent marked weakness of the legs and feet with more motor deficit on the left and more sensory loss on the right. Spine x-rays were normal, and there was no difficulty with bladder control, so the lesion was thought to

Fig. 1. Right carotid arteriogram 1 day after injury. Lateral (left) and anteroposterior (right) projections show no evidence of an aneurysm on the pericallosal artery. The aneurysm probably arose at the first point of bifurcation of the artery (cf Fig. 3).
be in the cerebral hemispheres beneath the site of cranial trauma rather than at the spinal level. No lumbar puncture was done.

Because of persistent headache and nausea and the development of papilledema in the right eye, a left carotid arteriogram was done on October 23, 8 days after the accident. The lateral projection was normal (Fig. 2 left), but the serial anteroposterior views with compression of the right carotid artery showed subdural hematoma over the left cerebral convexity with a small shift of the pericallosal arteries and the internal cerebral veins from left to right (Fig. 2 right). There was no evidence of hematoma on the right side. In retrospect, a small aneurysm of the right pericallosal artery may be visualized on the anterior view (arrow, Fig. 2 right). This artery was not filled on the lateral projection.

Operation. A small semiliquid subdural hematoma was evacuated through a left parietal craniectomy.

Postoperative Course. The patient had immediate relief of his headache and nausea. Within 10 days he was walking without assistance, but his left foot was still very weak. He was discharged on diphenylhydantoin, 300 mg per day, and did well at home for 2 days. On the third day he complained of severe right frontal headache, had a grand mal seizure, and was brought to the emergency room of Saint Louis University Hospital.

Second Examination. On admission the patient had decerebrate posturing, left-sided seizures, and a dilated right pupil with marked retinal hemorrhages. A right carotid arteriogram was performed immediately; during this procedure his respirations became periodic and both pupils dilated. An aneurysm of the right pericallosal artery arising at a point of bifurcation was demonstrated (Fig. 3). The anteroposterior projection demonstrated the aneurysm and a large shift from right to left.

Second Operation. A right frontal craniotomy was done at once. After opening the dura, a massive subdural hematoma was encountered and evacuated. The aneurysm then began bleeding profusely and was clipped along with its parent vessel. The aneurysm was not clearly seen before clips were applied. No intracerebral hematoma was found.

Second Postoperative Course. The patient remained decerebrate or decorticate for 1 month. He then remained in a mute state with no purposeful responses to verbal or painful stimuli for 2 months. He was discharged to a nursing home where he died in January, 1968, after a brief hyperpyrexic state.

Autopsy. The autopsy examination was limited to the cranium. There was softening of the right frontal lobe. The site of the aneurysm was obliterated by four Olivecrona...