Unusual Treatment of an Intracranial Aneurysm Contralateral to a Previous Common Carotid Ligation

A Case Report

JOHN D. NOFZINGER, M.D., LOUIS G. BRITT, M.D., FRANCIS MURPHEY, M.D., AND JAMES W. PATE, M.D.

Division of Neurosurgery and Department of Surgery, University of Tennessee, College of Medicine, and City of Memphis Hospitals, Memphis, Tennessee

The presence of multiple intracranial aneurysms, as well as the occurrence of aneurysms in bilateral symmetrical locations, has been well documented.\textsuperscript{1-3} Numerous questions arise concerning patients who have undergone successful surgical treatment for an intracranial aneurysm and who subsequently display clinical and arteriographic evidence of a second aneurysm on the contralateral side. Was the second aneurysm present initially but not visualized arteriographically? Did the previous surgical approach alter the hemodynamics in such a way as to produce or further the development of the second aneurysm? How can the aneurysm be treated?

The following case is reported to record an unusual approach to such a problem.

Case Report

\$250708. G.M., a 45-year-old Negro female, was first admitted to the City of Memphis Hospitals in June 1954, after a 3-day history of supraorbital headache, drooping of the left eyelid and double vision. Examination at that time demonstrated an almost complete palsy of the left 3rd cranial nerve and mild nuchal rigidity. A lumbar puncture revealed an opening pressure of 150 mm. of cerebrospinal fluid with 1400 red blood cells per cc. A percutaneous left common carotid arteriogram demonstrated an aneurysm approximately 5 mm. in diameter at the junction of the left internal carotid and posterior communicating arteries. A right carotid arteriogram was not done. Subsequently, ligation of the left common carotid artery was performed in one stage, 2 cm. below the bifurcation, without mishap. Postoperatively the patient did well, with complete recovery of function of the left 3rd cranial nerve.

The patient remained asymptomatic until June 1957, at which time over a 2-week period there developed a severe frontal headache. A sudden loss of consciousness followed by a grand mal seizure prompted her admission to another hospital. The physical examination at that time showed marked nuchal rigidity and hyperactive deep tendon reflexes, without specific localizing neurological signs. Lumbar puncture revealed grossly bloody spinal fluid under increased pressure. She was treated with supportive care and discharged greatly improved after 14 days of hospitalization.

She remained asymptomatic until March 1, 1963, when a sudden, severe, right temporal, pounding headache developed. Examination by her local physician demonstrated no specific neurological deficit, impairment of the cranial nerves or nuchal rigidity. The blood pressure was 130/100. On the following day a palsy of the right 3rd cranial nerve and moderate nuchal rigidity developed, and she was then transferred to this hospital. The rest of the past history and review of symptoms were noncontributory except for a known arterial hypertension which had existed since 1954 and for which she had received no treatment.

Examination. Blood pressure was 140/90, pulse rate was 70 and respiratory rate was 18. She had a partial palsy of the right 3rd cranial nerve and moderate nuchal rigidity. Lumbar puncture showed an opening pressure of 500 mm. cerebrospinal fluid, and the fluid was highly xanthochromic. Bilateral percutaneous carotid arteriography demonstrated a 1 cm. aneurysm at the junction of the right posterior communicating and internal carotid arteries (Fig. 1). The left carotid arteriogram showed a small 1 mm. residual stem in the area of the previous 5 mm. aneurysm. Retrograde flow down the left internal carotid artery demonstrated the point of ligation of the common carotid artery 2 cm. below the bifurcation (Fig. 2).

Left percutaneous femoral retrograde catheterized thoracic arteriograms demonstrated the left common carotid artery to be occluded in its entire length, except for a small segment at the point of its origin from the aortic arch (Fig. 3).

It was felt that the previous aneurysm of the left internal carotid artery was thrombosed. In view of the prior ligation of the left common carotid artery, an intracranial attack upon the right-sided aneurysm was thought to be too hazardous, even under profound hypothermic technique.

Operation. On March 15, 1963 the previously ligated circulation of the left common carotid artery was re-established by means of a graft of the saphenous vein. An end-to-end anastomosis was effected between the venous graft and the stump of the left common carotid artery above the previous ligation. An end-to-side anastomosis was effected between the venous graft and the left subclavian artery.

The right carotid bifurcation was then exposed. Complete occlusion of the right common carotid artery produced a drop in pressure in the right internal carotid artery from 120 mm. to 50 mm. Hg. A Crutchfield clamp was placed therefore on the right common carotid artery, but the artery was not partially occluded by the clamp at this time because the patient was under general anesthesia.

Course. The patient tolerated the operation well, and occlusion of the right common carotid artery by means

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Fig. 1 (left). Right carotid arteriogram demonstrating an aneurysm at the junction of the internal carotid and posterior communicating arteries.

Fig. 2 (right) Left internal carotid arteriogram demonstrating point of prior ligation of left common carotid artery.

Fig. 3 (left). Left retrograde femoral arteriogram demonstrating occlusion of left common carotid artery.

Fig. 4. (right) Postoperative left retrograde femoral arteriogram demonstrating occlusion of the right common carotid artery and patency of the left subclavian-carotid graft.