SURGICAL TREATMENT OF ANEURYSM OF THE
ANTERIOR CEREBRAL AND OF THE ANTERIOR
COMMUNICATING ARTERIES DIAGNOSED BY
ANGIOGRAPHY AND ELECTRO-
ENCEPHALOGRAPHY*

ARTHUR R. ELVIDGE, M.D., AND WILLIAM H. FEINDEL, M.D.
Department of Neurology and Neurosurgery, McGill University, and the
Montreal Neurological Institute, Montreal, Canada

(Received for publication April 28, 1949)

A

LTHOUGH the subject of intracranial aneurysm has received too much
attention in recent neurosurgical literature to consider it any longer
"a lesion having such remote surgical bearings" (Cushing30), never-
theless it continues to pose many difficulties in diagnosis and treatment.
Many of the diagnostic problems have been clarified by the stimulating
clinical studies of Symonds,51 and of more recent investigators including
Albright,1 Strauss, Globus and Ginsburg,49 Bramwell,2 McDonald and Korb,32
Richardson and Hyland,41 and Jefferson,22 and particularly by the develop-
ment of intracerebral angiography by Moniz,35 Dott,5,18 Jefferson,23 Elvidge,11
Engeset,12 and others.

The problems related to the surgical therapy have been reviewed by
Dott,9,10 Jefferson,24 Matas,34 Krayenbühl,36 Dandy,7 List and Hodges,30
Gross15 and Poppen.38 The role of carotid ligation in treatment has been
discussed by Schorstein,47 Dandy,7 Olivecrona,36 Krayenbühl,27 Dott10 and
Jefferson.24

Relatively few instances of successful surgical treatment of aneurysms
located on the anterior cerebral or anterior communicating arteries have
appeared in the literature. The present communication is concerned with 2
cases diagnosed by angiography and treated by direct surgical exposure. Follow-
up now extends over 3 years.

REVIEW OF LITERATURE

Carotid Ligation. In the cases previously published, treatment has been
carried out by carotid ligation or by direct exposure of the aneurysm or
occasionally by a combination of these two methods. Most saccular aneu-
rysms for which carotid ligation has been performed have been situated on
the carotid artery itself, but several authors mention anterior cerebral aneu-
rysms successfully treated by this method.

Krayenbühl38 has now ligatured either the common or internal carotid
in 8 cases of bleeding anterior cerebral aneurysm. One patient recovered
from a bitemporal hemianopsia caused by a large aneurysm of the anterior
communicating artery.27 In another case of severe haemorrhage from an

* Read in part at the thirty-sixth meeting of the Society of British Neurological Surgeons, Lisbon,
aneurysm of the left anterior cerebral artery satisfactory recovery followed ligation of the left common and internal carotid arteries. Olivecrona reported 9 cases of carotid ligation for supraclinoid sacular aneurysm, and 2 of these, noted as anterior cerebral in location, were improved by carotid occlusion. In a patient who had had two attacks of haemorrhage, 2 weeks apart, with hemiparesis from an aneurysm at the junction of the right anterior cerebral and anterior communicating arteries, Walsh and Love ligated the right internal carotid artery. Except for two attacks of "syncope," neurological examination was reported to be normal at the end of 3 months.

Results in these cases suggest that carotid ligation may be effective in the prevention of recurrent bleeding from aneurysms not only of the carotid artery but also those of the main cerebral vessels. The local lesion, however, still remains and its behaviour over a long period is not predictable. A larger series of cases with longer periods of follow-up will be necessary before the value of this method can be properly assessed.

Intracranial Approach. The method of direct intracranial exposure, albeit hazardous, is more precise. Nine cases of anterior cerebral aneurysm treated successfully in this manner have been reported. In 2, the aneurysm was excised; in 1, trapped between clips, and in the remaining 6, pieces of muscle were placed around or inside the aneurysmal sac. The recoveries are perhaps the more remarkable considering that in only 2 cases was a definite diagnosis by angiography established, and, in addition, the sac ruptured during operative manipulation in 4 instances.

The earliest reported case (Dott) was that of a man aged 53 years with an aneurysm at the junction of the left anterior cerebral and the middle cerebral arteries. The sac ruptured during the operation. Haemorrhage was controlled by muscle tamponade. The patient was well 6 years following operation.

Töniss demonstrated by arteriography an aneurysm of the anterior communicating artery. He exposed it by splitting the genu of the corpus callosum. Blood clot was removed and the sac surrounded with bits of muscle. The patient returned to work and was well a year later.

A leaking aneurysm of the right anterior cerebral artery in a boy aged 12 was removed by Cone in 1938 and reported by Russel. An encephalogram showed evidence of an expanding lesion in the right frontal region. An intracerebral haematoma was evacuated. This revealed an aneurysm, which was clipped and excised. The patient was in good health 7½ years later. This is the first recorded case of successful excision of an intracranial arterial aneurysm.

Dandy reported 2 successful results in 6 cases of anterior cerebral aneurysm. In his Case XXIV, a man of 49 years operated upon in 1941, the lesion, suspected of being a neoplasm, was a huge mass lying below and in front of the optic chiasm. It proved to be an aneurysm and was thought to arise from the anterior cerebral or the anterior communicating artery. The sac was opened, packed with muscle and cauterized. The left internal carotid artery