Risk of Rupture of a Second Aneurysm in Patients
With Multiple Aneurysms

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There are different opinions about the mortality associated with multiple aneurysms. McKissock, et al.,² state that multiple aneurysms are associated with a higher natural mortality than single aneurysms. In the Cooperative Study of Intracranial Aneurysms and Subarachnoid Hemorrhage,³ the multiple aneurysm patients had the same prognosis for survival as those with single aneurysms. According to McKissock, recurrent hemorrhage virtually always occurs from the original lesion. Nišioka³ found little evidence to suggest that more than one aneurysm would rupture within the follow-up time in the Cooperative Study. Therefore, treatment of the symptomatic lesion is commonly considered adequate.

At the Neurosurgical Clinic of the University Central Hospital during the years 1957–1968, we have operated on 84 patients with multiple aneurysms in whom the ruptured aneurysm was identified with certainty at the operation. Ten of these patients had a recurrent hemorrhage during follow-up periods varying from 4 months to 11 years. In eight of these 10 patients the recurrent hemorrhage was shown to be due to rupture of another previously unruptured aneurysm; in four instances the second hemorrhage was fatal. In one of the remaining patients the second hemorrhage did occur from the original lesion, as shown by autopsy. In the other case, autopsy was not performed, and it is not known which of the aneurysms bled.

Case Reports

Case 1. This 30-year-old woman had a subarachnoid hemorrhage in October, 1956, with residual left hemiparesis. Right carotid angiography showed an aneurysm of the middle cerebral artery. The left carotid angiogram was normal. At operation clear signs of hemorrhage were seen around the aneurysm, which was clipped. Postoperative angiography showed complete obstruction of the aneurysm. The patient was well and fully capable of work for the next 10 years.

In June, 1967, the patient had a second subarachnoid hemorrhage without any neurological deficit. Right carotid angiography showed no aneurysm. Left carotid angiography revealed an aneurysm of the middle cerebral artery. After the angiography, the patient had a third hemorrhage, resulting in deafness, severe dysphasia and mental deterioration. Operation was not performed. At follow-up examination in 1968, 1 year later, she had had no further hemorrhage, but was still deaf, dysphasic, and mentally slow.

The first hemorrhage was caused by rupture of a right middle cerebral aneurysm, the second 10 years later by rupture of a left middle cerebral aneurysm that had not been visible in the 1956 angiograms.

Case 2. This 24-year-old woman had a subarachnoid hemorrhage in August, 1957, without focal signs. Right carotid angiography was interpreted as normal (Fig. 1 upper left). Left carotid angiography disclosed an aneurysm of the posterior communicating artery, which was situated so low that direct intracranial clipping was considered impossible (Fig. 1 upper right). Therefore, the internal carotid artery was ligated in the neck. A week later an intracranial exploration was carried out to ligate the internal carotid artery intracranially as well. However, the artery was found to be thrombosed up to the bifurcation, and ligation was not done. Clear signs of hemorrhage were observed around the aneurysm.

The patient was well and fully capable of work for the next 10 years. In February, 1967, she had a second subarachnoid hemorrhage without any focal signs. Right carotid angiography showed an aneurysm at the bifurcation of the internal carotid artery (Fig. 1 lower left). Upon reexamination of

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the 1957 angiograms, a small aneurysm could be seen at this site; it had previously escaped notice. The aneurysm was clipped intracranially, and postoperative angiography showed that the cavity had been obliterated. The patient recovered and returned to work.

The 1957 operative findings revealed that the left internal carotid aneurysm had bled. In the intervening years the right internal carotid aneurysm had grown considerably; in fact, in 1957 it was so small that it could scarcely have been clipped.

Case 3. This 41-year-old woman had a subarachnoid hemorrhage in December, 1957, without focal signs, and a second hemorrhage in January, 1958. Left carotid angiography showed an aneurysm in the internal carotid artery at the base of the posterior communicating artery (Fig. 2 upper left) but right carotid angiography disclosed another aneurysm of the middle cerebral artery (Fig. 2 upper right). The internal carotid aneurysm was considered to be the ruptured one, and this was confirmed at operation. Postoperative angiography showed the aneurysm had been obliterated.

The patient was well until January, 1962, when she had another hemorrhage. On admission she was comatose and decerebrate. Right carotid angiography showed that the middle cerebral aneurysm had greatly increased in size (Fig. 2 lower right) and that there was an intracerebral clot in the temporal region. The hematoma was evacuated and the aneurysm clipped. The patient died 2 days after the operation. At autopsy the clips were well in place on both aneurysms.

In this case, the first subarachnoid hemorrhage was shown to be due to rupture of a left internal carotid aneurysm while the bleeding 5 years later was caused by rupture of a right middle cerebral aneurysm.

Case 4. This 30-year-old man developed a left third nerve palsy after 3 weeks of severe headache in October, 1958. The spinal fluid