CHANGES IN THE SIZE OF INTRACRANIAL ARTERIAL ANEURYSMS

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Despite the fact that intracranial arterial aneurysms occasionally are found in children, their occurrence is rare before the age of 15 years. But since they are comparatively common in adults, they must have begun to develop at some stage after childhood. Since little is known about how and when aneurysms grow, we have tried to elucidate the problem by a survey of a series of intracranial arterial aneurysms.

PATIENTS

Up to Jan. 31, 1962, some 700 patients with intracranial arterial aneurysms were seen in the Department of Neurological Surgery of the Helsinki University Central Hospital. On 19 of these, a second carotid angiography was performed after an interval varying between 2 weeks and 10 years, but without any decisive surgical procedures having been carried out in the meantime.

There were 8 men and 11 women. Their age at first hemorrhage ranged from 17 to 59 years, the mean being 39.5 years. All had had at least one verified subarachnoid hemorrhage, though not necessarily from the aneurysm considered in this report.

The aneurysms were located as follows:

<table>
<thead>
<tr>
<th>Artery</th>
<th>No. of Patients</th>
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<tbody>
<tr>
<td>Internal carotid</td>
<td>3</td>
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<tr>
<td>Bifurcation of internal carotid</td>
<td>3</td>
</tr>
<tr>
<td>Middle cerebral</td>
<td>9</td>
</tr>
<tr>
<td>Anterior communicating</td>
<td>3</td>
</tr>
<tr>
<td>Multiple aneurysms (right callosomarginal +left pericallosal)</td>
<td>1</td>
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<tr>
<td></td>
<td>19</td>
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</table>

Eleven patients were treated conservatively. On primary admission, an intracranial ligature of the aneurysm was attempted on 4 patients. However, postoperative angiography showed that the attempt had been futile, the aneurysm filling as before. Three patients with an aneurysm of the middle cerebral artery were operated upon for a second aneurysm: in 2 cases an aneurysm of the internal carotid artery, and in 1 an aneurysm of the anterior communicating artery. One patient with an aneurysm of the internal carotid artery also had an aneurysm of the internal carotid artery on the opposite side; this aneurysm was operated upon on first admission.

RESULTS

In 10 patients the aneurysm definitely had grown between angiographies, the interval being ½, 4, 5, 13, 13, 20, 47, 48, 62, and 125 months. Six of these 10 had suffered recurrent hemorrhage in the interval (½, 4, 13, 48, 62, and 125 months). One of these 6 had undergone intracranial exploration after the first angiography. In the remaining 4, there had been no symptoms suggesting recurrent hemorrhage during the interval (5, 13, 20, and 47 months). Two of these patients had undergone exploratory craniotomy after the first angiography.

In 8 patients, the size of the aneurysm was unchanged 4, 10, 11, 12, 15, 20, 22, and 88 months after the primary angiography. None of these patients had had a verified or clinically probable subarachnoid hemorrhage in the meantime.

In 1 patient, the aneurysm had disappeared during the interval; this patient had been subjected to an attempt at clipping of the aneurysm on primary admission.
SELECTED CASE HISTORIES

a) Growth of Aneurysm With Recurrent Hemorrhage (6 cases).

Case 1. Woman, born 1910. Subarachnoid hemorrhage with right hemiparesis and aphasia, Sept. 25, 1950. Left carotid angiography, May 11, 1951: small nubbin arising from the junction of the internal carotid and posterior communicating artery (Fig. 1). Recurrent hemorrhage, September 1961. Left carotid angiography, Oct. 10, 1961: large aneurysm of the internal carotid-posterior communicating junction (Fig. 2). Right carotid angiography, Oct. 18, 1961: widening of the infundibulum of the posterior communicating artery (Fig. 3).

Case 2. Woman, born 1902. Verified subarachnoid hemorrhage and left ophthalmoplegia in Spring of 1952. Left carotid angiography, June 4, 1952: aneurysm of the internal carotid artery (Fig. 4). Recurrent subarachnoid hemorrhage April 22, and May 24, 1955. In 1957, slowly progressing ophthalmoplegia. Left carotid angiography, Aug. 17, 1957: considerable growth of aneurysm (Fig. 5).

b) Growth of Aneurysm Without Recurrent Hemorrhage (4 cases).

Case 3. Woman, born 1895. Subarachnoid hemorrhage and slight aphasia, April 9, 1955. Left carotid angiography, May 6, 1955: aneurysm on left middle cerebral artery (Fig. 6). No symptoms of recurrent hemorrhage during interval. Left carotid angiography, April 18, 1959: slight increase in size of aneurysm (Fig. 7).

c) Size of Aneurysm Unchanged; No Recurrent Hemorrhage (8 cases).


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Figs. 1 and 2. Case 1. (Left) Small nubbin at the internal carotid-posterior communicating junction. (Right) Ten years later: the nubbin has grown into a large aneurysm.

Fig. 3. Case 1. Infundibular widening of the posterior communicating artery on the contralateral side.