Surgical treatment of asymptomatic and incidental intracranial aneurysms

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A consecutive series of 78 patients underwent surgery for 106 aneurysms between 1972 and 1978; this group included 14 patients with subarachnoid hemorrhage who had multiple, unruptured, incidental aneurysms (20 additional aneurysms). These aneurysms were operated on with no mortality. In 15 other patients, who underwent angiography for various nonhemorrhagic disorders, a total of 18 asymptomatic aneurysms were found. These were also operated on with no mortality. Three of the 29 patients had postoperative hemiplegia, which persists in only one. The author recommends that all aneurysms should be considered for operation when diagnosed, if the patient's clinical condition is stable.

KEY WORDS • intracranial aneurysm • incidental aneurysm • asymptomatic aneurysm

Intracranial aneurysms usually manifest themselves with a sudden episode of severe headache associated with subarachnoid hemorrhage (SAH). Less often they produce symptoms of cranial nerve dysfunction, or focal neurological deficit. Some unruptured aneurysms are discovered incidentally by angiography or by computerized tomography (CT) during investigation of neurological signs or symptoms. Many papers have reported the prognosis of the ruptured aneurysm, with surgical obliteration of the aneurysm by microsurgical techniques as the method of choice.

This report deals with 38 unruptured intracranial aneurysms (Table 1). These aneurysms were found in 29 patients from a consecutive series of 78 patients, with a total of 106 aneurysms operated on by the author between 1972 and 1978.

Summary of Cases

These 29 patients included 14 with SAH, who were found to have a total of 20 unruptured incidental intracranial aneurysms in addition to the aneurysms responsible for bleeding, and 15 other patients, whose 18 “asymptomatic” aneurysms were discovered by angiography carried out for different symptoms. The most frequent indications for angiography in the latter group were headaches (seven patients), carotid bruit (two patients), dizzy spells (two patients), and small cerebrovascular accident (infarct) (four patients).

The patients' ages ranged from 24 to 74 years, with a median age of 54 years. In 33 instances, surgery was via frontotemporal craniotomy with microsurgical techniques. All the aneurysms were diagnosed by angiography, and two patients had positive CT scans (large aneurysms). The aneurysms ranged in size from 2 mm to 1.5 cm. The mode of treatment is summarized in Table 2. Smaller aneurysms not suitable for clipping were coated with Aron Alpha "glue" (ethyl cyanoacrylate); larger aneurysms were clipped, the dome was opened to empty the sac, and then a small amount of glue was applied to the aneurysm and clip. Large aneurysms were ligated initially, then clipped and coated. Multiple aneurysms were treated at the same craniotomy if all of them were within reach, and, if not, the incidental or asymptomatic aneurysms were operated on at a later elective craniotomy. There were three aneurysms of the basilar bifurcation in two patients; these were treated by a left temporal craniotomy and coating with Aron Alpha glue in one, and a left frontotemporal craniotomy with clipping and coating in the patient with two incidental aneurysms.

All patients were in stable medical condition and physically active at the time of surgery. Four additional patients (not included in this report) were diagnosed to have unruptured aneurysms but were not operated on. Three of these patients were in good medical condition but refused to have any intracranial procedure for treatment of the aneurysms. The fourth had trigeminal neuralgia associated with an elongated aneurysm of an arteriosclerotic basilar artery; in
Surgery of asymptomatic or incidental aneurysms

TABLE 1
Summary of 38 unruptured aneurysms in 29 patients

<table>
<thead>
<tr>
<th>Location of Aneurysm</th>
<th>Asymptomatic</th>
<th>Incidental</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>internal carotid artery</td>
<td>11</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>basilar artery</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>anterior communicating artery</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>middle cerebral artery</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>internal carotid bifurcation</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>total</td>
<td>18</td>
<td>20</td>
<td>38</td>
</tr>
</tbody>
</table>

TABLE 2
Procedures for treatment of 38 unruptured aneurysms in 29 patients

<table>
<thead>
<tr>
<th>Procedure</th>
<th>No. of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>clipping only</td>
<td>6</td>
</tr>
<tr>
<td>clipping &amp; coating</td>
<td>27</td>
</tr>
<tr>
<td>coating only</td>
<td>5</td>
</tr>
</tbody>
</table>

that case, thermocoagulation of the Gasserian ganglion was advised and performed for symptomatic relief of pain.

There was no surgical mortality in the cases with "asymptomatic" incidental aneurysms. Four of the seven patients with headache improved markedly following surgery (one with coating and three with clipping and coating).

Complications included three postoperative cerebral infarctions. One occurred 3 weeks post-operatively, due to arterial occlusion at the site of the clipping of two middle cerebral artery aneurysms. The patient had good collateral flow, and fully recovered in 2 months. The second complication occurred 1 week after clipping of an anterior communicating aneurysm. The patient developed hemiparesis due to atheromatous occlusion of a branch of the left middle cerebral artery unrelated to the right frontotemporal craniotomy used for clipping the aneurysm. The patient improved in 2 months, and is not disabled. The third patient suffered left hemiplegia associated with surgery on an aneurysm of the right middle cerebral artery; hemiplegia partially resolved in 3 months, but this patient is disabled.

Discussion

There are differences of opinion regarding the management of incidental unruptured and asymptomatic aneurysms. Neither McKissock, et al., nor Paterson and Bond stated that treatment of unruptured aneurysms was indicated. Heiskanen and Marttila suggested clipping an incidental unruptured aneurysm if it could be reached through the approach used to treat the symptomatic aneurysm, but they did not advocate a second operation to clip it.

Recently, however, an increasing number of surgeons have advocated a more radical approach to the unruptured aneurysm. Pouyanne, et al., Mount and Brisman, and Samson, et al., have advocated the surgical obliteration of all intracranial aneurysms, including the asymptomatic type. There are recent data indicating the risk of bleeding and associated mortality of the unruptured aneurysm. Drake and Girvin found that 17% of their patients at risk bled from a previously unruptured aneurysm. Mount and Brisman, in reviewing the natural history of unruptured aneurysms, found that 10% of the patients bled, and 4% died over an average period of only 5 years after diagnosis.

Surgery of multiple aneurysms should be performed at the same craniotomy if they are within reach. However, if the asymptomatic or incidental aneurysm is in the opposite side or cannot be reached in the initial surgical procedure, it should be treated at a later craniotomy. Asymptomatic aneurysms in our series have been operated on with no mortality and low morbidity, leading to the recommendation that such aneurysms may be operated on when they are diagnosed, if the patient's condition is satisfactory.

In the author's series only three asymptomatic basilar artery aneurysms were operated on. This is too small a number of cases to draw any definite conclusion regarding this type of aneurysm.

References


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