Management of Giant Intracranial Aneurysms*

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Summary

Based on an own material of 64 cases a survey is given on the management of giant intracranial aneurysms.

Essential investigations are as well CT and Magnetic Resonance Scanning as detailed angiographic studies.

With regard to the operative handling the following questions are discussed: approach; use of temporary vascular occlusion and related monitoring; preparation of the aneurysm neck for occlusion.

In cases without recent subarachnoid haemorrhage morbidity and mortality were less than 10%. It was 15% in cases where recent haemorrhage had occurred.

Keywords: Giant aneurysm; management; diagnostic; operative technique; results.

Giant aneurysms pose a problem to the neurosurgeon. While like their smaller counterparts they may present with haemorrhage, they may also present with compression of neighbouring structures to which they tend to become very adherent. They may be further complicated by the presence within the sac of massive clot rendering the whole formidable mass quite difficult to handle. This paper is based on a total of sixty-four giant aneurysms treated by myself up until 1990. Their distribution is shown in Table 1. Thirty of them presented without subarachnoid haemorrhage and thirty-four had a history of subarachnoid haemorrhage either recently or in the past. In addition to this group of aneurysms treated by direct intracranial exposure, another twelve patients have been treated by internal carotid ligation only, two treated by balloon embolization: one successfully, one unsuccessfully, and two in whom no treatment was felt justified.

The age distribution of these sixty-four aneurysms does not support the earlier view that they tended to present rather later in life than their smaller counterpart.

Essential Investigation

More than in any other facet of the cerebral circulation, modern imaging techniques have greatly advanced the management of the giant intracranial aneurysm. In times past the surgeon might find himself operating on what angiographically might appear a small lesion but one which at operation turned out to be a formidable partly clotted sac whose relationship to the surrounding vessels had not been appreciated. Illustrations of this are shown in Fig. 1.

CT and Magnetic Resonance Scanning

The earliest and most rapid improvement in diagnostic capability arrived with CT scanning. A mass could be delineated on plain scan sometimes with calcification and often with the appearance of contained clotted blood and a contrast scan would demonstrate the flowing blood. Comparison of these two scans would clearly show the amount of clot within the lesion and one could compare the contrast scan picture with subsequent arteriography to determine accurately whether or not there was substantial clot within the lesion.

Table 1

<table>
<thead>
<tr>
<th>Giant aneurysms - LS</th>
<th>Total</th>
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<tbody>
<tr>
<td>Terminal carotid</td>
<td>30</td>
</tr>
<tr>
<td>Middle cerebral</td>
<td>11</td>
</tr>
<tr>
<td>Anterior cerebral</td>
<td>7</td>
</tr>
<tr>
<td>Posterior cerebral</td>
<td>16</td>
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<tr>
<td>Total</td>
<td>64</td>
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Fig. 1. (A) and (B) AP and lateral views of what appears a small middle cerebral aneurysm. The stretching of the perforating vessels would indicate that this is not the case. (C) Enhanced CT scans showing a giant aneurysm. (D) and (E) AP and lateral views post-operatively, showing that the neck was indeed relatively small and could be occluded by a single clip.