RESULTS OF DIRECT ATTACK ON NONFISTULOUS INTRACRANIAL ANEURYSM WITH REMARKS ON STATISTICS

CARL J. GRAF, M.D.
Department of Neurological Surgery, The Buffalo General Hospital and University of Buffalo School of Medicine, Buffalo, New York
(Received for publication December 9, 1954)

Statistics of successfully treated intracranial aneurysms are being more frequently recorded as larger series are developed. When these are broken down, various impressions are conveyed. This is particularly true when the lesions are individually described. Concerning such statistics, it seems misleading to speak in generalities. Aside from denominators common to all aneurysms, subarachnoid hemorrhage in particular, as well as intracerebral hematoma, "vasospasm," etc., many other factors come into play. We are speaking today of intracranial aneurysms as intracranial tumors were spoken of 40 years ago. As tumor differentiation is necessary for prognosis, so aneurysm differentiation is necessary depending upon type, anatomical location and the complications of the lesion.

In the hands of most surgeons, excluding Norlén and Olivecrona, the aneurysms of the anterior communicating artery complex carry a much higher morbidity and mortality than do those on other parts of the circle of Willis. In our experience the pure carotid aneurysms, or those of the internal carotid-posterior communicating junction, offer the greatest chance of success and the anterior communicating aneurysms the least. There is also a perceptible difference when one compares the results of the surgical treatment of bleeding aneurysms or ones that have recently bled, with those that have never done so. These and many other factors make proper statistical orientation difficult.

It does not seem valid to discuss only successful treatment of aneurysms associated with subarachnoid hemorrhage operated upon 3 or 4 weeks following the initial hemorrhage and to exclude those that have been attacked earlier. Experience has shown that in the first 3 weeks of the disease, surgical therapy is more dangerous than when applied later, but in this time the patient is in the greatest danger of perhaps recurrent fatal hemorrhage. This then is the challenge in the surgical therapy of these lesions.

Seemingly significantly large series of successfully treated aneurysms become in reality very small when one considers the tremendous number of variables involved. Since we cannot compare properly unlike objects, we cannot compare, for example, aneurysms of the anterior communicating artery with those of the internal carotid artery. The problem of their treatment is usually entirely different. Ordinarily one thinks of 100 cases of a particular
lesion as a reasonably representative number. But if we break down 100 cases of aneurysms occurring in four or five common but different locations, the significant figure of aneurysms at a specific site drops precipitously, thus losing statistical value. The conditions under which these lesions are attacked must also be considered and include: rupture, the time of operation after rupture, the intracranial pressure at the time of operation, the presence of intracerebral hematoma, the exact location of the aneurysm, the technique employed (clipping, lobe resection, ligation, etc.), the physiological state of the patient’s blood vessels and the neurological deficit. There should perhaps be a standardization of terminology. For proper evaluation of the effects of various forms of therapy the words “cure,” “improved,” and “satisfactory,” should be defined. The follow-up period should be specifically stated. We should be clear in considering the results of operation. Survival rates should perhaps come first, followed by residual neurological deficit, rehabilitation, etc. The conditions seem endless. These are but a few of the important questions that must be answered before we can properly evaluate the results of surgical treatment of these lesions. There is little value in comparing the results of treating 2 aneurysms of the posterior communicating artery with 15 or 20 aneurysms of the anterior cerebral complex. This tells us only that in the particular series the latter lesion is more common. It seems then, until much larger series have been developed, that statistical records will not carry much weight. It will mean, for example, that 100 aneurysms of each specific arterial trunk will have to be reported, operated upon in the same clinic, by one or two closely associated surgeons, employing the same techniques, under the same conditions. With so many variables concerned, this seems at present an insurmountable task. The answer, it appears, lies in part in a greater, wider experience covering many more years. Accumulated active experiences should be continually recorded, for it is only by this means that our knowledge of specific aneurysms variously treated can help us determine the best method of management. Lastly, there is a distinct necessity for statistics on the mortality of each aneurysm problem when untreated. Certainly the mortality of treatment should not be greater than the mortality rate of the disease. From reports of relatively small series of surgically treated aneurysms, only a few conclusions can be drawn. This will depend upon what the reader is looking for as well as what the writer is trying to say.

In this report the results of direct surgical attack in 55 cases of intracranial aneurysms are presented. These do not compare favorably with those in some published reports. We are disappointed with our figures but feel that the conditions are not comparable. It is our impression that this is because of a number of factors unrelated to surgical technique. Our statistics include all patients operated upon. The operative procedures were accomplished as soon as possible after diagnostic methods were completed. Perhaps this is poor judgment. Our aim was to reduce the mortality and possibility of early recurrent hemorrhage most common in the second and third week after the