to the anterior communicating artery whereas the aneurysm pointed towards anterior or anteroinferior, the approach is proceeded via frontal lobe at the point of A₂ portion bifurcation.

3) Middle cerebral artery aneurysm: The approach is proceeded alongside with the main branch of middle cerebral artery by separating the sylvian fissure from fronto-temporal approach.

The temporal approach by incision of temporal lobe is introduced in case the aneurysm pointed antero-upward direction or combined with intracerebral hematoma.

4) Internal carotid artery aneurysm: The approach to internal carotid artery is achieved alongside with sphenoid ridge and optic nerve via fronto-temporal approach. Various new type of clips are selected appropriately in each case.

We have 7 cases of the internal carotid artery ligation in which one postoperative death is beckoned. However Matas test for evaluating the cross circulation function is rather non-reliable for full dependency. However the carotid ligation can't be neglected for the aneurysm located below the clionoid process.

J-7. On the Surgery of the Aneurysm of the Middle Cerebral Artery

Tadashi AIBA

Department of Neurosurgery, University of Gunma

J-8. Factors Influencing Mortality in Intracranial Aneurysm Surgery

Fumio NOMURA, Kiyoto TAKAO

Yukio TAGASHIRA, Kimiyuki HORI and Takao MITSUNO

Seiya SHIRAKATA, Shigekiyo FUJITA

Norihiko TAMAKI and Hideyuki YAMASHITA

1st Department of Neurological Surgery, Kobe University School of Medicine

In the past 6 years, the cases of intracranial aneurysm treated in our clinic were 91 in total number (101 in the number of aneurysm), including 83 cases with a simple aneurysm and 8 cases with multiple aneurysm. There were 54 aneurysms in the internal carotid artery, 27 in the anterior communicating artery, 14 in the middle cerebral artery, 5 in the anterior cerebral artery and one in the vertebral artery.

The total number of operated cases was 73 including 69 cases treated with direct

intracranial operation for aneurysm. Operation was performed within 7 days after the attack of subarachnoid haemorrhage in 5 cases, but in the majority cases operation was performed 3 weeks after the onset under hypothermia (at around 30°C).

The important factors relative to surgical results in cases of intracranial operation were analyzed and concluded as follows. 1) Age in relation to surgical results; the operative result showed no significant difference in any types of the patients under 50 years of age, but the result was not satisfactory in the patients with arteriosclerosis over 60 years of age. 2) The relationship between the angiographic vasospasm was not certain because vasospasm were recognized in few cases. 3) The patients (59 cases) corresponding to grades I and II (by Hunt and Hess) showed recovery without any neurological deficits in 42 cases (71%), recovery with less neurological deficits in 5 cases (8%), showed major neurological disability in 3 cases (5%) and were fatal in 9 cases (15%). The patients (5 cases) corresponding to grades III showed recovery without any disability in 2 cases (40%) and with major neurological deficits in 3 cases (60%). The patients (4 cases) corresponding to grades IV, and V showed major neurological disability in 3 cases (75%) and was fatal in one case (25%). Surgical mortality and morbidity was high in poor risk patients corresponding to grade III-V. 4) Location of aneurysm in relation to mortality: Mortal cases of the patients with single aneurysm (61 cases) were not seen in aneurysm in the anterior cerebral artery (4 cases) and in aneurysm in the middle cerebral artery (8 cases), but mortal cases were seen 2 cases (10%) of 20 in anterior communicating artery (18 cases were operated by clipping). In 29 cases of aneurysm in the internal carotid artery, mortal cases were seen in one cases (6%) of 16 treated with clipping, 5 cases (56%) of 9 treated with trapping. Surgical result was markedly poor in the trapping cases of aneurysm in the internal carotid artery. 5) 7 cases of multiple aneurysm were operated simultaneously and no mortal cases were observed. 6) In 10 cases of mortal cases, there were 2 cases of A-2 obstruction with aneurysm in the anterior communicating artery and 6 cases of 8 aneurysm in the internal carotid artery, which was operated with trapping. In the majority of mortal cases, premature rupture of aneurysm occurred during operation and especially in the case of aneurysm in the internal carotid artery. In these cases giant aneurysms and the patients with severe arteriosclerosis were also included.

In concluding, it is suggested that the surgical result of intracranial operation is mainly affected by the degree of surgical risk and that the causes of mortal cases are mainly cerebral infarction and cerebral edema due to surgical occlusion of major intracranial vessels, particularly when carried out following premature rupture of aneurysm. Especially indication to clipping of aneurysm in the internal carotid artery must be carefully considered and are recommended to apply the clip with spring.