56. The Study of Cerebral Venous Disorder. Intracranial Abnormal Venous Network

Cerebral Venous Dysgenesis

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In this paper, we intended to clarify a cerebral vascular disorder due to pathological venous vasculature. 18 cases with abnormal cortical venous network was presented and the pathogenesis of this disease was discussed.

Clinical manifestations of this disease are mental retardation, rigospasticity, convulsive disorder and amaurosis. The disease occurs in young decade, especially in children under 8 years of age. However no sex predominance is noted. Angiographic findings of this disease are extremely characteristic, they are, early venous filling with fine capillary stain in subcortical region, marked venous abnormal network akin to embryonic venous network of the cortex and nonvisualization of deep veins, especially basal vein. This cortical venous abnormal network consists of fine spiral, tortuous venule, which drains into abnormal anastomotic vein or bridging vein of the cortex. Numerous pathological anastomosis between those abnormal vein and venules is elicited. Venous sinus occlusion has not been shown, as far as morphological study is concerned, these abnormal cortical venous network is quite different from collateral circulation in venous sinus occlusion or venous occlusive disease.

We call this pathological venous network as "cerebral venous dysgenesis" tentatively. The following pathogenesis should be considered.

- 1) Capillary angiomatous malformation, persistent embryonic venous network, due to developmental disturbance of the brain.
- 2) Agenesis or occlusive disease of deep cerebral vein.
- 3) Reactive proliferation of venous channels due to subdural effusion, or infection at perinatal period.

The pathogenesis of this disease has not been clarified yet, and further angiographic and clinico-pathological survey should be required.

57. Total Removal of the Cerebral Arteriovenous Malformation

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In the treatment of A-V malformation, it is accepted for total extirpation to be effective.

But if A-V malformation is located in the deep portion or in an important area of cerebrum, only conservative therapy, such as clipping of afferent artery or injection of plastic material, is performed.

It is true that there are some cases in which it is impossible to carry out total extirpation, but it is a duty for neurosurgeons to expand the operative indication by some method. In this film (16 mm technicolor, optical sound, 19 min.) four cases in which we have carried out total extirpation by a new method will be shown.

Under 27°C hypothermia, craniotomy is carried out. Afferent main artery from Willis' ring at the base of brain is exposed and temporary clipping is done.

Then total extirpation of A-V malformation is performed easily in dry field, with brain tissue uninjured as much as possible. In the case of A-V malformation, the permitted time of temporary clipping of cerebral blood flow is rather long.

In one case the clipping time was 95 minutes under 27°C hypothermia, but no postoperative disturbance was found. By this method the operation is performed in such A-V malformation of considerable risk as in deep portion of Sylvian fissure, in motor area, in motor area facing the falx, in deep portion of temporal lobe or accompanied with cerebral aneurysm.

Total extirpation of A-V malformation were successfully performed in all these cases with no postoperative disturbance at all. In this film total extirpation of A-V malformation in deep portion or in an important area of cerebrum is shown, which has been thought to be difficult to carry out.

As for the A-V malformation located in midline deep portion of cerebrum draining into deep cerebral vein and/or diffuse A-V malformation, the successful treatment must depend upon future therapeutical development.

58. Surgical Treatment of Intracranial Arteriovenous Malformation

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Since 1949 to 1971 (during 22 years), 177 cases of intracranial arteriovenous malformation (AVM) were treated in our clinic. 143 out of these 177 cases (81%) underwent surgical treatment as follows; extirpation-59 cases and other palliative operations such as ligation of afferent and efferent vessels (53 cases), artificial embolization (17 cases), cervical carotid ligation and decompression (7 cases). Operative mortality was 4% (6/143) in these surgical treatment.

In this report follow-up results were described. Surgical indication and treatment of AVM were discussed.