"Angiodysgenetic necrotizing encephalopathy"
and its different manifestations* **
Survey of age-related forms and clinico-pathological appearances

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Summary. Various observations of diffuse meningo-cerebral angiomatoses, which cannot be satisfactorily classified with the common phakomatoses, have been reported. They may occur at any age, with familial accumulation or sporadically. Divry and van Bogaert were the first to draw attention to such conditions in adults, where meningo-cerebral angiomatoses seemed to be combined with sudanophilic leukodystrophy. However, subsequently the latter was considered to be due to hypoxic damage to the white matter. In other observations, the severe damage to the grey matter was more evidently of hypoxic origin. Observations on two newborn individuals, sporadic examples of diffuse meningo-cerebral angiomatosis and with severe necrotic changes in the grey and white matter, are reported and discussed. Published reports on the various age-related forms are summarized and a general designation is suggested, which includes the various observations under a general heading. A parallel will be drawn between the meningo-cerebral angiomatosis and Foix-Alajouannine's disease.

Key words: Angiomatosis — Meningo-cerebral — Congenital — Necrotizing encephalopathy

The various forms of circumscribed intracranial hemangiomas and the hemangiomatous malformations occurring with the so-called phakomatoses are comprehensively described in both basic clinical and patho-anatomical literature.

Conversely, much less information is available on certain forms of diffuse meningo-cerebral angiomatoses, which occasionally occur at different ages and different sites and exhibit varying manifestations. They may be familial [2, 8, 10, 14, 15, 28] or sporadic [3, 7, 9, 16, 18–20, 33–35] and cannot be classified with the classical phakomatoses, such as von Hippel-Lindau's, Sturge-Weber's, Klippel-Trenaunay's, Louis Bar's syndromes and others. They seem to have more formal relations to Foix-Alajouannine's disease [6, 11, 17] as will be discussed later. However, a cerebral equivalent to this disorder of the spinal cord has not as yet been defined.

As a rule, the diffuse meningo-cerebral angiomatoses give rise to more or less severe mental disability, often occurring under the picture of progressive mental deterioration, which may result in a severely demented state.

Observations will be presented on two newborn infants, cases of sporadically occurring meningo-cerebral angiomatosis with necrotizing changes in the grey and white matter. There follows a review of the reported cases and an attempt to arrange the different forms in a common classification.

Case reports
Case 1

This female infant was the fourth child of healthy parents. Her brothers and sisters were normal. There was no family history of any hereditary disorders. At the 35th week of gestation, growth of her head had ceased. At birth she had an apgar score of 8–9. She was 48 cm long and weighed 3050 g. First examination revealed microcephaly with hyperbrachycephaly, dysplastic ears and multiple vascular nevi presenting sometimes as telangiectasias distributed over her trunk and extremities but not on her face.

On clinical examination, a systolic murmur could be heard over her heart. Laboratory findings included increased IgA and IgM serum globulin levels and a slightly increased antibody titer of 1:128 for cytomegalovirus. Tests for toxoplasmosis were negative. She died suddenly and unexpectedly on the 4th postnatal day.
Fig. 1A–D. Case 1. A Shrunken diffusely sclerotic brain ("walnut brain") weighing only 155 g. B Abnormal vessels in the white matter displaying features of an angiomatous angioma. The vessels are markedly congested, some showing thrombotic occlusion. The black region indicated by arrow represents granular calcium precipitations (Kossa reaction). C Leptomeninges and cerebral cortex with areas of colliquative necrosis on the left (arrow) and cystic replacement (asterisk) on the right. Laminar calcifications are indicated by arrowheads (Kossa reaction). Dilated vascular spaces can be seen in the subarachnoid space. D High power magnification of an arterio-venous shunt: Vein (V) at the top and artery (A) with elastic lamina in the thin vessel wall at the bottom (Elastica van Gieson). Black bars in B, C = 600 μm, in D = 150 μm

General autopsy

Autopsy (A-No. 896/79, Institute of General Pathology, University of Heidelberg) revealed myocardial hypertrophy of both ventricles associated with subvalvular muscular aortic stenosis. Her kidneys were severely dysplastic. Stenosis was present in the distal part of both ureters. No typical microscopic features of cytomegalovirus infection could be substantiated.

Neuropathological findings

These revealed a walnut-shaped brain of only 155 g with a brownish yellow discoloration (Fig. 1A). Coronal sections of the brain revealed extensive necrotic change of the grey and white matter in the regions supplied by the carotid arteries. Tissue portions from many regions of the CNS were embedded in paraffin and subjected to numerous conventional...