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## The anatomy of collateral venous flow from the brain and its value in aetiological interpretation of intracranial pathology.

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For more than a century, available data concerning collateral venous outflow from the brain have received insufficient attention, as existing theories did not assign practical importance to them. Ideas concerning arterial blood supply and circulation of cerebrospinal fluid were considered more relevant. But available data afford a schematic model of cerebral venous outflow that does have important pathophysiological consequences. Principal outflow through the internal jugular veins can be substituted completely by the large vertebral plexuses, through communications at the cranial base. Emissary veins of the skull vault are small and few in number. Outflow from the deep venous system through the great vein of Galen can be substituted by choroidal, thalamic and striate anastomoses toward the basal vein. So-called intracerebral venous anastomoses through the centrum semiovale towards the convexity are nonexistent or negligible. Instead, a venous watershed exists separating paraventricular white matter from a layer of subcortical white matter. In most infants, the cavernous sinus is not yet connected to the cerebral veins. Once such communications have been formed, important collateral pathways exist through basal and Sylvian veins via the cavernous sinus to the pterygoid plexuses. Simultaneous hindrance of principal and collateral venous outflow will lead to elevated venous pressure and eventual insufficiency of cerebral blood flow (CBF). This will cause increased intracranial pressure, and ventricular enlargement due to periventricular atrophy. The slow phase of the two-compartment model of CBF coincides with the paraventricular white matter area of the deep venous system. In the neonate CBF was found to be still very low, and in the two compartments CBF increases at a different rate to a maximum in childhood. In hydrocephalus, measurement of CBF in the slow deep compartment, rather than the fast cortical one, will be most informative.