Demonstration of Transventricular CSF Absorption
by Computerized Tomography

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With 6 Figures

Summary

Four cases are presented of marked periventricular oedema associated with hydrocephalus on CT scan. In one of the patients oedema, as well as the hydrocephalus, subsided after successful re-establishment of CSF absorption. The most likely explanation of the periventricular oedema is increased absorption of CSF by periventricular brain tissue.

Key words: CSF circulation, CT scan, Cerebral edema, Hydrocephalus.

The advent of computerized tomography (CT) brought a new method for studying the size and configuration of cerebral ventricles in vivo. Serial CT scans at frequent intervals enable us to follow the variation of ventricular size in patients with hydrocephalus. Furthermore, CT is particularly effective in determining not only the distribution of extracerebral fluid but also that contained within the parenchyma of the brain itself, since its principle is based upon the attenuation coefficient of parenchyma, which is a function of density. Our findings indicate that it is possible to demonstrate by CT the excess flow of CSF through the ependyma into the brain parenchyma in hydrocephalus.

Case Reports

Case 1. A 66-year-old woman was admitted on May 27, 1975, with a history of repeated subarachnoid hemorrhages and signs of left oculomotor palsy. Angiography revealed a left carotid artery aneurysm at the junction of the posterior
communicating artery. The aneurysm was successfully clipped. Four weeks later she developed progressive lethargy and headache. A CT scan at this time (June 25) showed small ventricles. However, by July 21, the ventricles had become moderately enlarged. Consequently, a ventriculo-peritoneal shunt was performed on July 26. A CT scan done three days later revealed that the ventricular end of the shunt was in good position but there was no change in the size of the ventricles. Postoperatively, the patient became alert but unfortunately she developed a Staph. infection that was controlled by systemic and intrathecal antibiotic treatment. The entire shunt was then removed (August 8). A CT scan revealed marked hydrocephalus (August 12). On August 15 a lumbo-peritoneal shunt was inserted. At this point the patient was lethargic and confused but she followed commands and moved all extremities well. Within the next two months the condition of the patient deteriorated and eventually she became akinetic and mute. Repeated shunt studies with Tc$^{99m}$ showed good flow from the ventricle into the abdominal cavity.