

Water on the brain? Putting the "Hydro" on the "Cephalus"

Hydrocephalus, in the most basic sense, means an increased amount of fluid in the spaces of the brain. This fluid is specifically called cerebrospinal fluid (CSF) with "cerebro" referring to brain and "spinal" referring to the spinal cord. The fluid occupies space surrounding the brain and spinal cord as well as spaces located in the inner portion of the brain. These spaces are known as the cerebral ("brain") ventricles ("cavities" or "hollow spaces" similar to the ventricles of the heart that fill with blood).

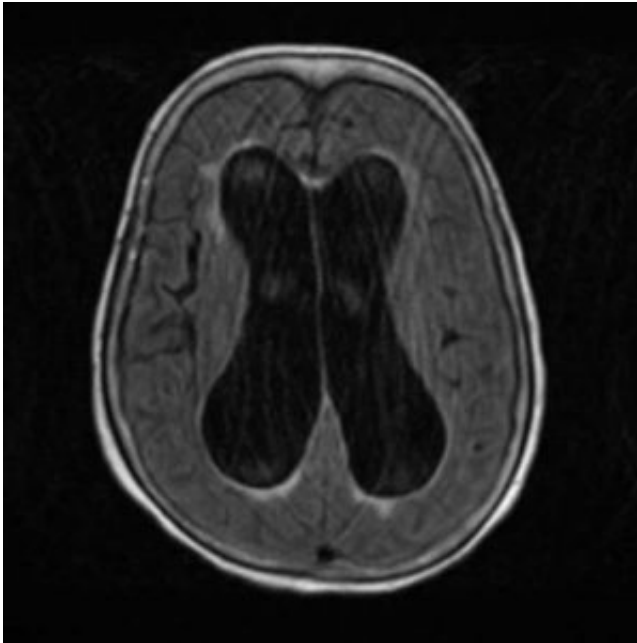


Fig. 1. This is a CT (computed tomography) scan of a patient with hydrocephalus. The enlarged spaces called ventricles containing cerebrospinal fluid (i.e., fluid in the spinal canal) are noted.

The brain has two lateral ventricles, a third ventricle, and a fourth ventricle that connect directly to the spinal canal, which contains the spinal cord. Infections, such as meningitis, can be identified via analysis of this fluid by performing a lumbar puncture, or spinal tap. Normally, the ventricles remain a specific size because CSF is secreted and absorbed at a consistent rate, thereby avoiding any abnormal accumulation of fluid.

Enlarged cerebral ventricles may result from their distension by increased pressure, or from atrophy caused by the loss of cells. Increased production of CSF or decreased absorption of CSF by cells can lead to elevated pressures in the ventricles, causing hydrocephalus. Why is this bad? As the ventricles increase in size, they compress the brain tissue, thereby causing impairment in thinking, memory, or action. How do alterations in CSF production or absorption occur? Infections

such as meningitis, trauma, tumors, or idiopathic (i.e., no identifiable cause) etiologies are common. The elderly may undergo loss of some brain tissue over time, which causes imaging to show hydrocephalus without symptoms. In turn, congenital forms of hydrocephalus exist that may or may not produce symptoms. Those without symptoms are referred to as having “compensated” hydrocephalus.

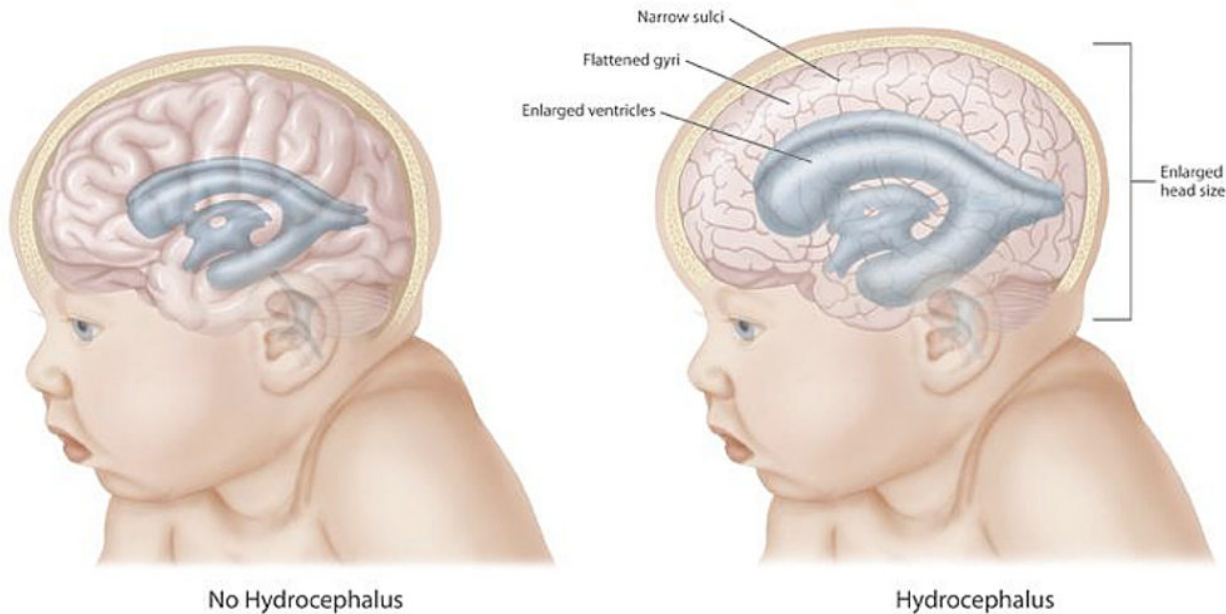


Fig. 2. This illustration shows the normal size of the ventricles and abnormal size. The term "sulci" refers to the spaces among parts of the brain (called "gyri").

Thus, even if your brain on imaging looks like hydrocephalus, that does not mean you will become symptomatic. Many people have forms of compensated hydrocephalus and live normal lives. It is important to be aware of this from both a physician and patient perspective when interpreting imaging of the brain.

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[Compensated hydrocephalus.](#)

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