Cerebrospinal fluid absorption

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- Surgical Nuances in Ultrasound-Guided Percutaneous Distal Catheter Placement in Pediatric Ventriculoatrial Shunts
- Two Cerebrospinal Fluid (CSF) Diversion Procedures for Two Separate CSF Pathologies in a 19-Year-Old Male: A Case Report
- Rapid Absorption of a Spontaneous Primary Intraventricular Hemorrhage
- A case of young woman with intracranial gumma developed within 1 year after Treponema pallidum infection
- A freely accessible, adaptable hollow-fiber setup to reproduce first-order absorption: illustration with linezolid cerebrospinal fluid pharmacokinetic data
- Noncommunicating Hydrocephalus Caused by Aseptic Meningitis Can Be Treated With Endoscopic Third Ventriculostomy
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Cerebrospinal fluid also flows directly from the ventricles into the brain tissue surrounding them.

CSF is absorbed into the bloodstream through structures called arachnoid villi or granulations, located within the arachnoid mater, typically along the superior sagittal sinus. These villi act as one-way valves, allowing CSF to move from the subarachnoid space into the venous blood system. Regulation of CSF Pressure:

The production, flow, and absorption of CSF are balanced to maintain consistent intracranial pressure (ICP). This pressure must remain within a specific range for proper brain function. Changes in the circulation of CSF can result in conditions like hydrocephalus (abnormal accumulation of CSF) or intracranial hypertension.

Cerebrospinal fluid circulation from sites of secretion to sites of absorption largely depends on the arterial pulse wave. Additional factors such as respiratory waves, the subject's posture, jugular venous pressure and physical effort also modulate Cerebrospinal fluid flow dynamics and pressure. Cranial and spinal arachnoid villi have been considered for a long time to be the predominant sites of CSF absorption into the venous outflow system [1)]

CSF is absorbed primarily by arachnoid villi (granulations) that extend into the dural venous sinuses. Other sites of absorption include the choroid plexuses and glymphatics. The rate of absorption is pressure-dependent [2)].

Hydrocephalus refers to excessive secretion of cerebrospinal fluid, its insufficient absorption, or its blocked circulation and frequently occurs after a cerebral hemorrhage [3)]

1)

Sakka L, Coll G, Chazal J. Anatomy and physiology of cerebrospinal fluid. Eur Ann Otorhinolaryngol Head Neck Dis. 2011 Dec;128(6):309-16. doi: 10.1016/j.anorl.2011.03.002. Epub 2011 Nov 18. PMID: 22100360.

2)

Griffith HB, Jamjoom AB. The Treatment of Childhood Hydrocephalus by Choroid Plexus Coagulation and Artificial Cerebrospinal Fluid Perfusion. Br J Neurosurg. 1990; 4:95–100

3)

Luo L, Li M, Wan X, Lu Y, Yu X. Altern Ther Health Med. 2023 Jun 16:AT8572. Epub ahead of print. PMID: 37318895.