Hydrocephalus treatment

- Establishment and evaluation of a novel rat model of the fourth ventricle hemorrhage
- Optimizing outcomes in intracranial ependymoma: a contemporary review
- An aggressive, unresected pineoblastoma in an adult woman: the role of exclusive radiotherapy - a case report and literature review
- Fluid dynamics model of the cerebral ventricular system
- Postoperative hydrocephalus in patients with infratentorial brain metastases may be influenced by preoperative treatment: a single-center cohort study
- Post-traumatic hydrocephalus after decompressive craniectomy: a multidimensional analysis of clinical, radiological, and surgical risk factors
- Risk factors for the development of hydrocephalus in traumatic brain injury: a systematic review and meta-analysis
- Low- and negative-pressure hydrocephalus in children, clinical features, treatment, prognosis and proposed mechanisms

Hydrocephalus treatment has largely been limited to surgical cerebrospinal fluid diversion, as specific and efficient pharmacological options are lacking, partly due to the elusive molecular nature of the cerebrospinal fluid secretion apparatus and its regulatory properties in physiology and pathophysiology.

Medical treatment

Hydrocephalus medical treatment.

Surgery

Hydrocephalus surgery.

Infratentorial tumor associated hydrocephalus

In cases with hydrocephalus at the time of presentation, some authors advocate initial placement of VP shunt or EVD prior to definitive surgery (waiting for ≈ 2 wks before surgery) because of possibly lower operative mortality [1)]. Theoretical risks of using this approach include the following:

1. placing a shunt is generally a lifelong commitment, whereas not all patients with hydrocephalus from a p-fossa tumor will require a shunt

2. possible seeding of the peritoneum with malignant tumor cells e.g. with medulloblastoma. Consider the placement of tumor filter (may not be justified given the high rate of filter occlusion and the low rate of “shunt metastases” [2)])

3. some shunts may become infected prior to the definitive surgery

4. definitive treatment is delayed, and the total number of hospital days may be increased

5. upward transtentorial herniation may occur if there is excessively rapid CSF drainage

Either approach (shunting followed by elective p-fossa surgery, or semi-emergent definitive p-fossa surgery) is accepted. At Children's Hospital of Philadelphia, dexamethasone is started and the surgery is performed on the next elective operating day, unless neurologic deterioration occurs, necessitating emergency surgery [3].

Some surgeons place a ventriculostomy at the time of surgery. CSF is drained only after the dura is opened (to avoid upwards herniation) to help equilibrate the pressures between the infra- and supratentorial compartments. Post-op, the external ventricular drain (EVD) is usually set at a low height (≈ 10 cm above the EAM) for 24 hours, and is progressively raised over the next 48 hrs and should be D/C'd by ≈ 72 hrs post-op.

Racial disparities

Racial disparities in hydrocephalus treatment

1)
Albright L, Reigel DH. Management of Hydrocephalus Secondary to Posterior Fossa Tumors. Preliminary Report. J Neurosurg. 1977; 46:52–55
2)
Berger MS, Baumeister B, Geyer JR, et al. The Risks of Metastases from Shunting in Children with Primary Central Nervous System Tumors. J Neurosurg. 1991; 74:872–877
3)
McLaurin RL, Venes JL. Pediatric Neurosurgery. Philadelphia 1989