Shunt-dependent hydrocephalus

- Post-traumatic hydrocephalus after decompressive craniectomy: a multidimensional analysis of clinical, radiological, and surgical risk factors
- Pre- and post-cranioplasty hydrocephalus in patients following decompressive craniectomy for ischemic stroke: a systematic review and meta-analysis
- Cerebrospinal fluid analysis and changes over time in patients with subarachnoid hemorrhage: a prospective observational study
- Machine learning models in the prediction of chronic or shunt-dependent hydrocephalus following subarachnoid hemorrhage: A systematic review and meta-analysis
- Serum uric acid is associated with shunt dependent hydrocephalus of aneurysmal subarachnoid hemorrhage patients
- Vitamin K Deficiency Bleeding Intracranially Resulting in Shunt-Dependent Hydrocephalus
- Effect of shunt-dependency on long-term outcome after aneurysmal subarachnoid hemorrhage: a post-hoc analysis of the EARLYDRAIN prospective patient cohort
- Cerebral Hemorrhage Volume Threshold and Shunt-Dependent Acute Hydrocephalus in Aneurysmal Subarachnoid Hemorrhage: A Semiautomated Measurement Study

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Shunt-dependent hydrocephalus refers to a condition in which a person with hydrocephalus requires the use of a shunt to divert excess cerebrospinal fluid (CSF) from the brain to another part of the body, Without the shunt, there is a risk of fluid accumulation and increased intracranial pressure.

Pathogenesis

The pathogenesis of shunt-dependent hydrocephalus involves obstruction of blood products or adhesions which blocks cerebrospinal fluid circulation within the ventricular system, fibrillation of aseptic inflammation after aneurysmal subarachnoid hemorrhage which may cause CSF mal-absorption [1) 2) 3)].

Risk Factors

Shunt-dependent hydrocephalus Risk Factors.

Monitoring and Complications

Patients with shunt-dependent hydrocephalus require regular monitoring to ensure the proper functioning of the shunt. Complications such as infections, blockages, or malfunctions can occur and may require prompt medical attention.

Lifelong Management:

Shunt-dependent hydrocephalus often requires lifelong management. Regular follow-ups with healthcare providers, imaging studies, and adjustments to the shunt system may be necessary over time.

Retrospective observational cohort studies

Subarachnoid Hemorrhage Volume, intraventricular hemorrhage volume, intracerebral hemorrhage volume, and total hemorrhage (TH) were computed from brain CT scans utilizing AW Server analytical software. ROC curves and multivariate analyses were employed to determine the association between hemorrhage volumes and SDAHC. The study included 170 patients, of whom 111 (65.3%) were women, with a mean age of 58.5 years (SD: 14.6). Fifty-five patients (32.4%) presented SDAHC. intraventricular hemorrhage volumes had an area under the ROC curve of 0.757 (95% CI: 0.674-0.839; p <0.001). An IVH volume > 2.7 cm^3 showed a sensitivity of 70.9% and a specificity of 77.2% for predicting SDAHC, while TH volumes > 29.5 cm^3 demonstrated a sensitivity of 69.1% and a specificity of 61.4%. Multivariate analysis revealed that IVH volumes > 2.7 cm^3 (OR 5.373; 95% CI: 2.477-11.657), TH volumes > 29.5 cm^3 (OR 2.232; 95% CI: 1.008-4.942), and a bicaudate index ≥0.2 were significantly associated with SDAHC, adjusting for confounders. In aSAH patients, semiautomatic measurement of hemorrhage volumes using specialized software is independently associated with SDAHC. This method could facilitate early prediction and timely intervention [4)].

This is a well-conceived and clinically relevant study that contributes meaningfully to the literature on aSAH complications. While its methodological rigor is commendable, future studies should aim to validate and refine the thresholds in larger, multicentric cohorts, and integrate clinical, radiological, and biochemical markers into comprehensive SDAHC prediction tools.

An observational retrospective analytic study of the patients with spontaneous SAH admitted to Miguel Servet University Hospital between 2017 and 2022. Patients' clinical and radiological characteristics, type of treatment, diagnoses and treatment of hydrocephalus, complications of ventriculoperitoneal shunts, and mortality are some of the data achieved in this study. A descriptive study of these variables has been done and, subsequently, the most relevant variables have been statistically analyzed to identify patients with an increasing risk of shunting for hydrocephalus. This study was authorized by the Ethics Committee before its elaboration.

Results: A total of 359 patients with spontaneous SAH were admitted to Miguel Servet University Hospital between 2017 and 2022, with an intrahospital death rate of 25.3%. 66.3% of the total of patients with SAH were due to intracranial aneurysm rupture (n = 238). 45.3% of the patients with aneurysmal SAH required an external ventricular drain (EVD) to treat acute hydrocephalus. 11.7% (n = 28) developed a shunt-dependent hydrocephalus. Statistical significance was found between shunt-dependent hydrocephalus and the following: high score in modified Fisher scale and placement of EVD. The mean interval from EVD to ventriculoperitoneal shunt placement was 26.1 days. The mean rate of reoperation of patients after shunt was 17.7%, mostly due to infection.

The most significant risk factor for shunt-dependent hydrocephalus after aneurysmal subarachnoid hemorrhage was high Fisher scale and previous need for external ventricular drainage. Shunt infections are the main cause of shunt reoperation. Early shunt placement in selected patients might

reduce the rate of infectious complications [5].

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