External ventricular drain for severe traumatic brain injury

- External Ventricular Drain Versus Intraparenchymal Pressure Monitor in Severe Traumatic Brain Injury: A TRACK-TBI Study
- Release of Extracellular Matrix Components after Human Traumatic Brain Injury
- Veterans Traumatic Brain Injuries and Neurosurgical Challenges: A Narrative Review
- Quantity of Caloric Support After Pediatric Severe Traumatic Brain Injury: Description of Associated Outcomes in a Single Retrospective Center Cohort, 2010-2022
- Navigating the Role of Surgery in Optimizing Patient Outcomes in Traumatic Brain Injuries (TBIs): A Comprehensive Review
- Comparative Efficacy and Safety of External Ventricular Drains and Intraparenchymal Pressure Monitors for Intracranial Pressure Monitoring in Traumatic Brain Injury: A Systematic Review and Meta-analysis
- External lumbar drainage for the management of refractory intracranial hypertension in pediatric severe traumatic brain injury: a retrospective single-center case series
- Post-Traumatic Cerebral Venous Sinus Thrombosis (PtCVST) Resulting in Increased Intracranial Pressure during Early Post-Traumatic Brain Injury Period: Case Report and Narrative Literature Review

Retrospective studies

A study suggests that in patients with moderate traumatic brain injury-severe traumatic brain injury where an EVD is needed, early (≤ 24 h post-injury) insertion may result in better long-term functional outcomes. This finding supports future prospective investigations in this area [1].

In a comparative effectiveness study, CSF diversion was not associated with improved outcomes 6 months after TBI, but a decrease in ICP was observed. Given the higher quality of evidence generated by this study, current evidence-based guidelines related to CSF diversion should be reconsidered [2].

External ventricular drains (EVDs) are commonly used in neurosurgery in different conditions but frequently in the severe traumatic brain injury treatment (TBI) to monitor and/or control intracranial pressure (ICP) by diverting cerebrospinal fluid (CSF). Their clinical effectiveness, when used as a therapeutic ICP-lowering procedure in contemporary practice, remains unclear. No consensus has been reached regarding the drainage strategy and optimal timing of insertion [3].

External ventricular drainage (EVD) is frequently used to control intracranial hypertension after traumatic brain injury. However, the available evidence about its effectiveness in this context is limited. The aim of this study is to evaluate the effectiveness of EVD to control intracranial pressure and to identify the clinical and radiological factors associated with its success.

Methods: For this retrospective cohort study conducted in a Level 1 trauma center in Paris area between May 2011 and March 2019, all patients with intracranial hypertension and treated with EVD were included. EVD success was defined as an efficient and continuous control of intracranial hypertension by avoiding the use of third-tier therapies (therapeutic hypothermia, decompressive craniectomy, and barbiturate coma) or avoiding a decision to withdraw life-sustaining treatment due to both refractory intracranial hypertension and severity of brain injury lesions.

83 patients with EVD were included. EVD was successful in 33 patients (40%). Thirty-two patients (39%) required a decompressive craniectomy, and eight patients (9%) received barbiturate coma. In ten cases (12%) refractory intracranial hypertension prompted a protocolized withdrawal of care. Complications occurred in nine patients (11%) (three cases of ventriculitis, six cases of catheter occlusion). Multivariate analysis identified no independent factors associated with EVD success.

In protocol-based management for traumatic brain injury, EVD allowed intracranial pressure control and avoided third-tier therapeutic measures in 40% of cases with a favorable risk-benefit ratio [4)]

ICP elevation is common during EVD weaning trials in patients with TBI. ICP-related parameters, including delta ICP and ICP burden, are significant outcome predictors. There is a need for larger prospective studies to further explore the relationship between ICP during EVD weaning trials and TBI outcomes [5)].

1)
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2)
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3)
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4)
Moyer JD, Elouahmani S, Codorniu A, Abback PS, Jeantrelle C, Goutagny S, Gauss T, Sigaut S. External ventricular drainage for intracranial hypertension after traumatic brain injury: is it really useful? Eur J Trauma Emerg Surg. 2022 Feb 16. doi: 10.1007/s00068-022-01903-4. Epub ahead of print. PMID: 35169869.
5)
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