

Observational Study

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The insertion and management of an external ventricular drain in pediatric patients with hydrocephalus associated with medulloblastoma

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Abstract

An external ventricular drain (EVD) is used to facilitate cerebrospinal fluid (CSF) removal in medulloblastoma patients suffering from hydrocephalus. It is essential to recognize that EVD management plays a crucial role in influencing the incidence of drain-related complications. However, the ideal method for EVD management remains undetermined. Our research sought to examine the safety of EVD placement and the impact of EVD on the incidences of intracranial infections, postresection hydrocephalus, and posterior fossa syndrome (PFS). We conducted a single-center observational study involving a cohort of 120 pediatric medulloblastoma patients who were treated from 2017 to 2020. The rates of intracranial infection, postresection hydrocephalus, and PFS were 9.2%, 18.3%, and 16.7%, respectively. EVD did not influence the occurrence of intracranial infection ($p = 0.466$), postresection hydrocephalus ($p = 0.298$), or PFS ($p = 0.212$). A gradual EVD weaning protocol correlated with an elevated incidence of postresection hydrocephalus ($p = 0.033$), whereas a rapid weaning approach resulted in 4.09 ± 0.44 fewer drainage days ($p < 0.001$) than the gradual weaning strategy. EVD placement ($p = 0.010$) and intracranial infection ($p = 0.002$) were linked to delayed speech return, whereas a longer duration of drainage was conducive to the recovery of language function ($p = 0.010$). EVD insertion was not correlated with the incidence of intracranial infection, postoperative hydrocephalus, or PFS. The optimal EVD management method should encompass a rapid EVD weaning strategy, followed by prompt drain closure. We have presented additional evidence to improve the safety of EVD insertion and management in neurosurgical patients to ultimately facilitate the establishment of standardized institutional/national implementation and management protocols.

Keywords: External ventricular drain; Hydrocephalus; Infection; Medulloblastoma; Posterior fossa syndrome.

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