

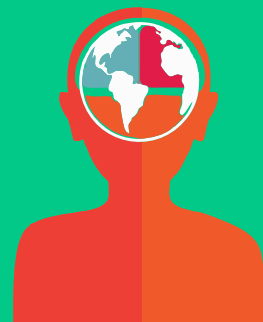
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abstract

Shunt Revision in Tumor-Related Hydrocephalus in Pediatric Patients

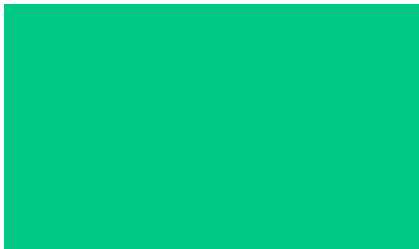
Zuhaa Rehman, Farrukh Javeed

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abstract



Shunt Revision in Tumor-Related Hydrocephalus in Pediatric Patients

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Introduction: Tumor-related hydrocephalus (HCP) is a common manifestation in pediatric brain tumors, frequently managed with a Ventriculo-peritoneal (VP) shunt. This study aims to identify the rate and predictors of shunt revision and functional outcomes in our cohort.

Methodology: This retrospective, monocentric study was undertaken, including the pediatric patients from the age of 0-16 years with a diagnosis of intracranial tumor and hydrocephalus, who underwent shunt placement at our center. Demographics, tumor and shunt characteristics, and revision outcomes were analyzed using univariate and multivariate logistic regression.

Results: Among 48 pediatric patients with tumor-related hydrocephalus who underwent VP shunt placement, 33.3% (16) required revision. The cohort had a mean age of 8.5 ± 3.4 years; 54.2% were male. Posterior fossa tumors were most

common (66.7%), with medulloblastoma (27.1%) and ependymoma (18.8%) as leading tumor types. At baseline, 50% of children had moderate hydrocephalus; all received fixed-pressure VP shunts. Logistic regression identified that inadequate initial shunt placement was significantly associated with revision (OR = 0.064, 95% CI: 0.012–0.341, $p = 0.001$), indicating a 94% reduction in risk with proper placement. Valve type also significantly predicted revision (OR = 17.3, 95% CI: 1.31–228.7, $p = 0.030$). Tumor location, tumor type, hydrocephalus severity (Evans Index), and timing of shunt placement were not predictive. CSF picture significantly influenced the choice of revision procedure ($p = 0.027$), with infected cases undergoing external ventricular drainage followed by delayed shunt replacement. No significant improvement in ventricular size was observed post-revision ($p = 0.119$). Functional outcomes varied, with only 50% achieving good recovery. Neurodevelopmental delay was strongly associated

with poor outcome ($p = 0.003$).

Conclusions: The findings underscore that optimal initial shunt placement and appropriate valve selection are crucial in minimizing revision risk.

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