ABSTRACT

J Neurosurg Pediatr. 2022 Nov 18:1-15. doi: 10.3171/2022.10.PEDS22308. Online ahead of print.

Quality indicators for evaluating the 30-day postoperative outcome in pediatric brain tumor surgery: a 10-year single-center study and systematic review of the literature.

Sletvold TP(1), Boland S(1), Schipmann S(2), Mahesparan R(1)(2).

Author information:
(1)1Department of Clinical Medicine, University of Bergen; and.
(2)2Department of Neurosurgery, Haukeland University Hospital, Bergen, Norway.

OBJECTIVE: Surgery is the cornerstone in the management of pediatric brain tumors. To provide safe and effective health services, quantifying and evaluating quality of care are important. To do this, there is a need for universal measures in the form of indicators reflecting quality of the delivered care. The objective of this study was to analyze currently applied quality indicators in pediatric brain tumor surgery and identify factors associated with poor outcome at a tertiary neurosurgical referral center in western Norway.

METHODS: All patients younger than 18 years of age who underwent surgery for an intracranial tumor at the Department of Neurosurgery at Haukeland University Hospital in Bergen, Norway, between 2009 and 2020 were included. The primary outcomes of interest were classic quality indicators: 30-day readmission, 30-day reoperation, 30-day mortality, 30-day nosocomial infection, and 30-day surgical site infection (SSI) rates; and length of stay. The secondary aim was the identification of risk factors related to unfavorable outcome. The authors also conducted a systematic literature review. Articles concerning pediatric brain tumor surgery reporting at least two quality indicators were of interest.

RESULTS: The authors included 82 patients aged 0-17 years. The 30-day outcomes for unplanned reoperation, unplanned remission, mortality, nosocomial infection, and SSI were 9.8%, 14.6%, 0%, 6.1%, and 3.7%, respectively. Unplanned reoperation was associated with eloquent localization ($p = 0.009$), primary emergency surgery ($p = 0.003$), and CSF diversion procedures ($p = 0.002$). Greater tumor volume was associated with unplanned readmission ($p = 0.008$), nosocomial infection ($p = 0.004$), and CSF leakage ($p = 0.005$). In the systematic review, after full-text screening, 16 articles were included and provided outcome data for 1856 procedures. Overall, the 30-day mortality rate was low, varying from 0% to 9.3%. The 30-day reoperation rate varied from 1.5% to 12%. The SSI rate ranged between 0% and 3.9%, and 0% to 17.4% of patients developed CSF leakage. Four studies reported infratentorial tumor location as a risk factor for postoperative CSF leakage.

CONCLUSIONS: The 30-day outcomes in the authors' department were comparable to published outcomes. The most relevant factors related to unfavorable outcomes are tumor volume and location, both of which are not modifiable by the surgeon. This highlights the importance of risk adjustment. This evaluation of quality indicators reveals concerns related to the unclear and nonstandardized definitions of outcomes. Standardized outcome definitions and documentation in a large and multicentric database are needed in the future for further evaluation of quality indicators.

DOI: 10.3171/2022.10.PEDS22308
PMID: 36401544