

$p = 0.01$) and occurred in patients with longer lengths of stay ($p < 0.0001$) and discharge destination other than home ($p = 0.001$). **Conclusions:** The presence of medical comorbidities and advanced age are not reasons to exclude patients with GBM from surgical consideration. Postoperative complication is the most significant predictor of survival in elderly patients and can be avoided by a short length of stay and discharge home.

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The Rising Incidence and Prevalence of Brain Tumours: a Canadian epidemiological study

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Background: Primary malignant brain tumours account for over one third of all brain tumours and are associated with high morbidity and mortality. The purpose of this paper is to estimate the rate and trends of incidence and prevalence for primary malignant CNS tumours in Canada from 1992 to 2017. **Methods:** An epidemiological study using publicly available data from Statistics Canada: Canadian Cancer Registry (CCR) from 1992 to 2017 for all of Canada was conducted. Incidence and prevalence per 100,000, age-standardized incidence, and age-standardized prevalence per 100,000 person-years of primary malignant CNS tumours were calculated and stratified by sex and age: pediatric (0-19), adult (20-64), and elderly (>64) populations. **Results:** During the study period, incidence and prevalence increased by 27.3% and 28.8%, respectively. Males accounted for 56% of all diagnoses and experienced decreased survival compared to females one year after diagnosis (p -value = 0.04). Age-standardized rates of incidence and prevalence were highest in elderly populations. **Conclusions:** Overall, the incidence of primary malignant CNS tumours has increased from 1992 to 2017 with males and the elderly disproportionately affected. Increased healthcare resources and awareness are needed to better identify and deliver evidence-based care for these patients.

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Surgery for recurrent GBM: deciding when to operate

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Background: Previous studies have found conflicting results regarding the role of repeat surgery on overall survival (OS) in patients with GBM. We used a novel approach that includes time to tumour recurrence as an additional prognostic factor in order to determine which patients benefit most from repeat surgery. **Methods:** A retrospective chart review from 1992-2018 was performed on all adult (≥ 18 years old) patients with primary GBM that received surgery for recurrent disease and compared to publicly available data from The Cancer Genome Atlas (TCGA) of adult patients with primary GBM that did not undergo surgery for recurrent disease. **Results:** A total of 672 adult patients with GBM were included in the study, including 87 that received surgery at tumour recurrence (surgery cohort). The surgery cohort

had longer OS and similar complication rates to those that did not receive surgery at recurrence, independent of time to tumour recurrence ($p < 0.0001$ and $p = 0.4$, respectively). Within the surgery cohort, patients with tumour recurrence >6 months demonstrated additional survival benefit ($p < 0.0001$). **Conclusions:** Surgery for recurrent GBM leads to improved survival without increased complications. Patients with tumour recurrence >6 months benefit most from repeat surgery.

NEUROCRITICAL CARE

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Assessment of External Ventricular Catheter Associated Infections at the Ottawa Hospital: Literature Review and Quality Improvement Initiative

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Background: External ventricular drains are a lifesaving intervention in the management of acute hydrocephalus. EVD associated infections vary significantly, and expert panels recommend reviewing institutional policies if infection rates exceed 10%. The audit aims to identify the infection rate at our institution, whereas the literature review aims to synthesize a new institutional EVD best practice guideline. **Methods:** An audit of EVD catheters inserted in the time period between 07/01/2019 and 10/25/2020 was conducted. Statistical analysis to calculate absolute incidence, infections per 1000 days of catheter use. A literature review to identify best practices for the insertion and management of EVDs was conducted. **Results:** 75 patients required a total of 105 EVD catheters. There were 16 (15.3%) EVD related infections, equating to 14.3 infections per 1000 days. Fifty percent of patients developed an EVD related infection within 9 days of insertion. Most infections were induced by skin flora (87.5%). A comprehensive step-by-step EVD insertion and management protocol was developed aiming to reduce the risk of infection. **Conclusions:** The incidence of EVD associated infections at the Ottawa Hospital is significantly higher than acceptable rates as suggested by expert panels. A new evidence-based best practice guidelines should be implemented. A follow-up audit is necessary.

NEUROIMAGING

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Application of the Anatomical Fiducials Framework to a Clinical Dataset of Patients with Parkinson's Disease

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Background: Establishing spatial correspondence between subject and template images is necessary in neuroimaging research and clinical applications. A point-based set of anatomical