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Frame-based stereotactic brain biopsy: A retrospective review of diagnostic yield and complications at a Canadian Center

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Background: Historically, frame-based stereotactic brain biopsy (SBB) has played an important role in the diagnosis of intracranial lesions. We performed a single centre analysis of the outcomes and efficacy of SBB at the London Health Sciences Centre (LHSC). **Methods:** We performed a retrospective chart review of frame-based SBB from 2006 to 2017 at the LHSC. Intra-operative and final pathology reports were analyzed for biopsy diagnosis and the diagnosis was compared with pre-operative neuroimaging reports for correlation. SBB-associated morbidity and mortality were investigated using chart review and post-operative neuroimaging. **Results:** 173 consecutive patients were identified. The overall morbidity rate was 8.7% (15 cases) and mortality rate was 0.6% (1 case). Final biopsy diagnostic accuracy was 96%, intra-operative diagnostic accuracy was 94% and pre-operative imaging diagnostic accuracy was 65%. Elevated partial thromboplastin time and the presence of hemorrhage on post-operative CT were associated with neurological morbidity and mortality. The need to obtain three or greater samples the time of biopsy was associated with non-diagnostic biopsy. **Conclusions:** At the LHSC, SBB is a relatively safe and effective surgical procedure with high diagnostic yield and relatively low risk of complications. Intra-operative pathology has a high efficacy in determining diagnosis when compared to final pathology.

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Feeling Green

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Background: Myeloid sarcoma (MS) is a rare solid tumour made of myeloblasts or immature myeloid cells in an extramedullary site or in bone, associated with systemic hematologic neoplasms. When they occur in the brain parenchyma, they can often be misdiagnosed. **Methods:** The authors report a case of a 4-year old boy 6 months out of remission from AML, presenting with a short history of headaches and vomiting, and found to have a heterogenous contrast-enhancing lesion in the right cerebellar hemisphere, with differential diagnosis of myeloid sarcoma, astrocytoma, medulloblastoma and ATRT. Preliminary diagnosis was made flow cytometry from an intraoperative biopsy. The patient had a long course of chemotherapy and radiation, but eventually died from the systemic burden of his AML. **Results:** The authors present a literature review on 178 published cases of CNS myeloid sarcomas, and their radiological presentation and the basis of immunohistochemical and pathological diagnosis is discussed. **Conclusions:** Diagnosis rests on a combination of immunohistochemistry and histopathology of biopsied tissue. Surgical resection is controversial, especially given the efficacy of chemotherapy and radiation, and prognosis remains unclear. As with all uncommon and rare clinical entities, further investigation is warranted to determine prognosis and optimal management of CNS myeloid sarcomas.

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Association Between Extent of Resection and Survival in Pediatric Patients with High-Grade Glioma: A Systematic Review and Meta-Analysis

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Background: While pediatric high-grade glioma (HGG) has a poor prognosis, the relationship between extent of resection (EOR), tumor location, and survival remains unclear. Our aim is to determine whether gross-total resection (GTR) is associated with prolonged survival relative to subtotal resection (STR) and biopsy. **Methods:** PubMed, Ovid EBM Reviews, Embase, and MEDLINE were systematically reviewed. Eligible articles were included for study-level and individual-patient data (IPD) meta-analysis. Difference by study-level and IPD characteristics were estimated using subgroup meta-analysis and meta-regression. PRISMA guidelines were followed. **Results:** In total, 33 studies were included. Study-level meta-analysis found GTR conferred decreased mortality relative to STR at 1 year (RR=0.73, 95% CI=0.59-0.89) and 2 years (RR=0.74, 95%CI=0.64-0.84). STR did not demonstrate survival advantages compared to biopsy at 1 year (RR=0.81, 95%CI=0.64-1.03), but showed decreased mortality at 2 years (RR=0.90, 95%CI=0.82-0.99). IPD meta-analysis comprised 186 patients, and indicated that STR (HR=2.61, 95% CI=1.56-4.38) and biopsy (HR=2.83, 95%CI=1.54-5.19) had shortened survival relative to GTR, with no differences between STR and biopsy (HR=0.93, 95%CI=0.55-1.56). In subgroup analysis, GTR was associated with prolonged survival for hemispheric tumors (HR=0.16, 95%CI=0.07-0.36) **Conclusions:** Among pediatric patients with HGGs, GTR was independently associated with better overall survival compared to STR and biopsy, especially in patients with hemispheric tumors.

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Impact of peritumoral edema during tumor treatment field therapy: a computational modelling study

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Background: Tumor treatment fields (TTFields) are an approved adjuvant therapy for glioblastoma. The magnitude of applied electrical field is related to the anti-tumoral response. However, peritumoral edema (ptE) may result in shunting of