

P.151**The development of an image-guided, multi-biopsy tool for neurosurgical applications***K Andrews (Kingston)* H Ploeg (Kingston) J Purzner (Kingston) T Purzner (Kingston)*

doi: 10.1017/cjn.2025.10297

Background: Molecular characterization of spatially heterogeneous tumors, such as primary brain tumors, requires precise, contamination-free tissue collection. This study develops a novel biopsy instrument enabling efficient, spatially registered tissue collection across tumors and surgical cavities, advancing personalized tumor characterization and treatment. **Methods:** Iterative modeling and 3D printing were used to develop prototypes, which underwent proof-of-concept and phantom testing. Final device evaluation compared the novel capsule biopsy tool to Yasargil tumor grasping forceps, with six neurosurgeons and six students conducting tests on porcine brain. Additionally, intraoperative samples were collected, with spatial coordinates recorded on preoperative scans. **Results:** The design features a capsule that attaches to the end of a Frazier suction. When suction is applied, an internal piston secures the sample, which can later be released before or after tissue fixation. The capsule method reduced variability in sample weight and collection time compared to Yasargil forceps, maintaining tissue integrity without contamination or instrument failure. Notably, students demonstrated proficiency comparable to experienced surgeons, highlighting the tool's ease of use. **Conclusions:** This low-cost, optically tracked biopsy tool provides an efficient, reliable method for spatially precise tissue collection, meeting the demands of precision medicine and translational research.

P.152**Local control and survival in brain metastases treated with cavity directed gamma knife radiosurgery: a single center retrospective study***N Alarifi (Toronto)* A Ajisebutu (Winnipeg) J Beiko (Winnipeg)*

doi: 10.1017/cjn.2025.10298

Background: This local study aims to address gaps in understanding factors influencing local control in patients with brain metastases treated with adjuvant Gamma Knife Radiosurgery. **Methods:** A retrospective analysis used a local, prospectively kept Gamma Knife database. Sixty-three patients treated with GK SRS were included. Variables included demographics, tumor characteristics, SRS parameters, and outcomes such as local control, recurrence, survival, and adverse effects. **Results:** At 12 months, local control was 66.7%, decreasing to 57.1% at 24 months. Distant progression occurred in 58.7%, leptomeningeal disease in 15.9%, and adverse radiation effects in 20.6%. The 12-month survival rate was 63.5%, dropping to 38.1% at 24 months. None of the examined factors significantly influenced local control. Local progression within the first year of treatment was associated with a 5.0-fold increased risk of death at 24 months, while distant intracranial progression showed a 6.0-fold increased risk at 12 months and an 8.2-fold increased risk at 24 months. **Conclusions:** While the

parameters we examined were not linked to local control, intracranial progression significantly impacted survival. This real-world cohort provides valuable insights into the challenges of managing brain metastases. Further work is needed to refine the current treatment strategies for intracranial progression and ultimately improve survival outcomes.

P.153**Predictors and clinical outcomes of postoperative cerebrospinal fluid leak after endoscopic endonasal skull base surgery***A Vargas-Moreno (Ottawa)* S Khairy (Ottawa) M Saymeh (Ottawa) J Rabski (Ottawa) S Kilty (Ottawa) F AlKherayf (Ottawa)*

doi: 10.1017/cjn.2025.10299

Background: This study aimed to identify risk factors for postoperative cerebrospinal fluid (CSF) leaks and assess their outcomes following endoscopic endonasal approach (EEA) for resection of skull base tumors. **Methods:** A retrospective review was conducted of patients who underwent EEA for resection of intradural pathology between October 2001 and October 2023. Data on demographics, approach type, reconstruction technique, tumor pathology, complications and outcomes were analyzed. **Results:** A total of 542 patients were included, with 80.1% undergoing surgery for sellar or suprasellar pathology. Lumbar drains were used in 14.9%, and dural sealants in 57.7%. Forty patients (7.3%) developed postoperative CSF leaks, with the highest rate in sellar or suprasellar lesions (5.9%). CSF leaks were associated with longer hospital stays ($p < 0.001$), higher 30-day readmission rates ($p < 0.001$), increased sepsis risk ($p = 0.021$), and higher rates of diabetes insipidus ($p < 0.001$). Lumbar drains increased the incidence of CSF leaks ($p = 0.021$), while nasoseptal flap reconstruction reduced leak rates ($p = 0.0015$). Higher BMI and intraoperative CSF leaks were also significant risk factors ($p = 0.001$). **Conclusions:** CSF leaks are associated with increased complications and extended hospital stays, highlighting the need for vigilant intraoperative monitoring and targeted strategies.

P.154**The endoscopic endonasal transclival approach for the treatment of skull base lesions***A Vargas-Moreno (Ottawa)* S Khairy (Ottawa) M Saymeh (Ottawa) J Rabski (Ottawa) S Kilty (Ottawa) F AlKherayf (Ottawa)*

doi: 10.1017/cjn.2025.10300

Background: Surgical access to the clival region is challenging, but advanced endoscopic endonasal approaches (EEA) provide a minimally invasive corridor. This study aimed to review the clinical outcomes of patients who underwent EEA for skull base lesions involving the clivus and to analyze prognostic factors. **Methods:** A retrospective review was conducted of patients who underwent EEA for resection of clival lesions between October 2001 and October 2023. Data on demographics,