

NEURO-ONCOLOGY

P.040

Moncton brain tumour tissue biorepository: diagnostic and therapeutic initiatives for glioma research in New Brunswick

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Background: Improving diagnostic and therapeutic tools associated with glioblastoma multiforme (GBM), an aggressive brain tumour, is crucial as average patient survival remains slightly over a year. Challenges include early diagnosis and acquired drug resistance. Improving these challenges notably require a multidisciplinary team and a dedicated brain tumour specimen collection initiative. We hypothesize that implementing such an approach in Moncton would provide significant benefits to GBM patients and researchers in New Brunswick. **Methods:** A Brain Tumour Tissue Repository was instigated to collect and preserve primary tumour specimens. Storage of circulating samples from patients undergoing temozolomide (TMZ) therapy was also performed. In parallel, molecular leads were investigated in different GBM models to identify therapeutic targets. **Results:** Collection of 7 primary specimens was accomplished in 2016. Over 15 primary samples are housed in the tumour biorepository to date with circulating samples collected from 3 patients. Additionally, numerous deregulated non-coding RNAs were identified by qRT-PCR in GBM models and shown to be modulated following TMZ treatment warranting further investigation. **Conclusions:** Overall, these results provide novel therapeutic leads for GBMs and, most importantly, highlight the instigation of a New Brunswick-based brain tumor biorepository which will undoubtedly strengthen brain tumour research in the Maritimes.

P.041

Adult craniopharyngioma: case series, systematic review and meta-analysis

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Background: The optimal therapeutic approach for adult craniopharyngioma remains controversial. Some advocate for gross total resection (GTR), while others support subtotal resection followed by adjuvant radiotherapy (STR + XRT). **Methods:** MEDLINE (1946 to July 1st 2016) and EMBASE (1980 to June 30th 2016) were systematically reviewed. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline was followed. At our institution, from 1975 to 2013, 33 patients were treated with initial surgical resection for adult onset craniopharyngioma. 22 patients were included in the present case series. **Results:** Eligible studies (n=21) were identified from the literature in addition to a case series of our institutional experience. Three groups were available for analysis: GTR, STR + XRT, and STR. The rates of recurrence were 17 %, 27 % and 45%, respectively. This differs from childhood population. The difference in risk of recurrence after GTR vs. STR + XRT did not reach significance (OR: 0.63, 95% confidence

interval: 0.33-1.24, P = 0.18). This maybe because of low pooled sample size (n=99) who underwent STR+XRT. **Conclusions:** This is the first and largest meta-analysis examining rate of recurrence in adult craniopharyngioma. Thus, when safe and feasible, a goal of gross total resection should be favored. Each patient should be considered on a case-by-case basis.

P.042

The use of functional MRI in low grade glioma surgery - a Canadian survey

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Background: The goal of a brain tumour operation is maximal safe resection. No widely used guidelines for the use of functional magnetic resonance imaging (fMRI) in these patients currently exist. In this study we are trying to determine if and how Canadian neurosurgeons use fMRI in the management of patients with low grade glioma (LGG). **Methods:** A 15-25 minute survey was created using an online survey tool. In Part One of the study the survey was distributed to neurosurgery consultant and resident staff at the London Health Sciences Centre (LHSC). In Part Two of the study the survey is being distributed to members of the Canadian Neurosurgical Society. The survey consists of two sections - background and case-based decision making. **Results:** There were six surveys from the LHSC staff. On average respondents indicated that they obtain fMRI for 9% of LGG patients, though 67% indicated that they were comfortable ordering and interpreting fMRI studies. In the case-based section, fMRI data did not tend to affect respondents' preferred treatment, confidence in their treatment, or their predicted risk of surgical treatment. **Conclusions:** In this limited survey of LHSC neurosurgical staff there was no regular use of fMRI in LGG patients. We await the results of a national survey of Canadian neurosurgeons.

P.043

Presence of infiltrative glioblastoma cells in an isolated area of diffusion restriction

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Background: Diffusion weighted imaging (DWI) has useful diagnostic and predictive value in the assessment of glial tumors. Most studies evaluating the use of DWI in glioblastomas have done so in regions that overlap with abnormal T2/fluid attenuation inversion recovery (FLAIR) signal or contrast enhancement. Isolated DWI abnormalities, which do not overlap with contrast enhancing lesions, are less commonly described. Their relationship with the tumour, and implications for prognosis, are not well understood, though it has been speculated that these lesions may represent infiltrative tumour cells. To our knowledge, this is the first reported case where the presence of infiltrative tumour cells in an area of diffusion restriction has been confirmed via biopsy. **Methods:** A ring enhancing lesion and isolated DWI hyperintensity from a newly diagnosed patient were biopsied separately. **Results:** Pathological specimens from both targets were identified as glioblastoma (WHO Grade IV), negative for IDH-1 R132H mutation, with methylated MGMT promoter. **Conclusions:** In patients with glioblastoma, DWI hyperintensities distant from

areas of abnormal T2/FLAIR or contrast enhancement can contain infiltrative tumour cells. The presence of isolated diffusion restriction may be a useful predictor of disease progression and prognosis but further investigation into the nature and behavior of isolated DWI lesions is required.

P.044

Prospective clinical detection of 2-hydroxyglutarate to predict IDH-mutant gliomas using magnetic resonance spectroscopy: preliminary results

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Background: With the advent of the 2016 WHO classification of tumours, prognostically distinct subclasses of glioma have been revealed. A subset of gliomas which harbor the isocitrate dehydrogenase (IDH) mutation have a survival advantage. 2-Hydroxyglutarate (2-HG) is a byproduct of faulty IDH metabolism in IDH mutants making it an ideal tumour biomarker. Since pre-operative detection of this metabolite using magnetic resonance spectroscopy (MRS) may yield valuable information for the neurosurgeon, we undertook the first Canadian utility study to detect 2-HG via MRS. **Methods:** We will recruit 150 patients presenting with a newly suspected glioma. All patients will undergo MRS scans for 2-HG pre-operatively and the neuropathologist will determine IDH status post-operatively based on immunohistochemistry and DNA sequencing. Pre-operative detection of 2-HG will be compared to post-operative IDH status. **Results:** To date, of 34 eligible subjects, 29 have glioma determined by pathology. Seven of these were IDH-mutant positive by pathology, of which 3 were detected by MRS. One glioma positive for 2-HG on MRS turned out to be IDH mutant negative on pathology. **Conclusions:** Prospective detection of 2-HG via MRS is feasible in the clinical setting. Additional subjects as well as refinement of our MRS protocol may yield higher sensitivity and specificity of this novel and clinically relevant diagnostic tool.

Neurovascular and Neurointerventional

P.045

Case of cavernous malformation hemorrhage immediately following normal brain imaging

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Background: Spontaneous hemorrhage from angiographically occult vascular malformations is not a rare occurrence. We present a case of in-hospital cavernous malformation rupture after initial normal CT. **Methods:** A 55-year-old female presented with severe headache with onset during activity, and normal neurological examination. Rapid neurological deterioration occurred 60 minutes following the CT scan. The patient was intubated, and repeat CT scan showed significant parafalcine ICH and intrahemispheric SAH. ICU transfer and expectant management led to neurological recovery and discharge to rehabilitation. **Results:** The patient underwent

angiography on initial admission which was negative. A delayed MRI showed the presence of a cavernous malformation. This was followed conservatively with repeat imaging. The malformation remained stable. **Conclusions:** Our unique case highlights the sudden onset of hemorrhage occurring almost immediately following normal brain imaging. A cavernous malformation was discovered to be the cause, and was observed.

P.046

Multiple intracranial mycotic aneurysms and management dilemma in postinterventional cerebral vasospasm: a case report

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Background: Intracranial mycotic aneurysms are rare forms of vascular abnormalities. They are typically fragile and have high tendency to bleed. Even when they are successfully secured upon intervention, the medical management can be challenging in presence of other non-ruptured aneurysms and concomitant cerebral vasospasm. **Methods:** A 31 year old female was admitted with right sided large intracerebral hemorrhage due to ruptured mycotic MCA aneurysm. She was also known with severe tricuspid regurgitation from drug abuse. Others aneurysms were also located intracranially and extracranially, including subclavian and renal arteries. **Results:** The MCA aneurysm was successfully clipped during decompressive craniectomy. The non-ruptured left ACA aneurysm was occluded through endovascular intervention. Due to cardiac condition and presence of other non-secured extracranial aneurysms, we followed the MNI protocol for treating cerebral vasospasm by milrinone infusion. The treatment was successful for over three weeks until another micro-aneurysm had ruptured which had lead to severe and rapid clinical deterioration, that had lead eventually to death. **Conclusions:** Intracranial mycotic aneurysms remain challenging. Patients should be selected for surgical clipping versus endovascular intervention based on clinical state and radiological features. We suggest using milrinone over induced hypertension therapy for post-intervention cerebral vasospasm in order to lower the risk for rupturing non-secured aneurysms.

P.049

Seasonal variations in aneurysmal subarachnoid hemorrhage: revisiting the myth using google trends

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Background: Results of previous studies examining seasonal variation in the incidence of aneurysmal subarachnoid hemorrhage (SAH) are conflicting. The aim of this study is to investigate whether there is a seasonal effect in online search queries for SAH that may reflect an association between meteorological factors and aneurysm rupture. **Methods:** We utilized the Google Trends data service to analyze the volume of internet queries for SAH on Google's search engine from January 1, 2004 to November 2016. We used compre-