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

MS Taccone (Ottawa) TB Nguyen (Ottawa) J Woulfe (Ottawa) I Moldovan (Ottawa) G Melkus (Ottawa) IG Cameron (Ottawa) F Al-Kherayf (Ottawa)*

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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

S Ahmed (Saskatoon) ME Kelly (Saskatoon) L Peeling (Saskatoon)*

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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

AA Al Jishi (Hamilton) R Takroni (Hamilton)* H Whittingham (Hamilton) M Meade (Hamilton) A Freitag (Hamilton) B Van Adel (Hamilton)*

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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 extarcranial aneurysms, we followed the MNI protocol for treating cerebral vasospsam by milrinone infusion. The treatment was successful for over three weeks until another microaneurysm 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

J Ku (Toronto) NM Alotaibi (Toronto) J Wang (Toronto) GM Ibrahim (Toronto)*

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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-

hensive search terms and collected data from: USA, Canada, Finland, and Japan, as well as worldwide search volume. Potential seasonal variations in the data were assessed by comparative non-parametric tests and curve-fit regression model. *Results:* Our analyses revealed that USA had the highest median search scores (115 vs. 86, 46, 46 for Finland, Canada and Japan, respectively). The term "brain aneurysm" was the commonly used search term among countries, followed by "cerebral aneurysm". There was no evidence of seasonality in any of the countries studied on both univariate tests and regression time-adjusted analysis. *Conclusions:* There are no seasonal variations in internet search query volume for SAH. Further studies are needed to explore whether online search volumes correlate with the actual incidence of SAH.

P.050

Minimally invasive disconnection of spinal dural arteriovenous fistulas in a hybrid neurovascular operating room

SP Lownie (London) H Wang (London) F Haji (London) MR Boulton (London)*

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Background: Hybrid neurovascular operating rooms offer significant advantages for vascular neurosurgery. In 2008, we installed North America's first robotic intraoperative rotational 2D/3D angiography unit in a neurosurgery operating room. To date, 200 procedures have been performed. *Methods:* In selected cases of spinal dural arteriovenous fistula (dAVF)requiring surgical disconnection, intraoperative spinal angiographic roadmapping, angiographic image overlay onto the skin and surgically exposed spine, and laser cross-hair image guidance were utilized to accurately determine the location and trajectory of the draining vein. *Results:* In four cases of spinal dAVF, a minimally invasive approach was employed, via either single-level (N=2) or two-level (N=1) hemilaminectomy. Techniques used included: angiographic roadmap / image overlay and intraoperative fluoroscopic with laser light guidance. These provided sub-centimeter accuracy in localizing the path of the draining vein. Surgical incision lengths ranged between 4 to 5 cm, with the shortest incision measuring only 4.2 cm. Complete cure was obtained in all cases, with no untoward complications. *Conclusions:* Hybrid neurovascular operating room technology can facilitate the use of minimally invasive approaches to spinal dural AVF disconnection.

P.051

Validation of the unruptured intracranial aneurysm treatment score against "real-world" MDT decisions

*H Godbout (Halifax) J Jarrett (Halifax) GE Pickett (Halifax)**

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Background: Intracranial aneurysms are relatively common and often incidentally detected. Elective treatment may eliminate the risk of future hemorrhage, but carries risks of permanent deficit or death. Case-control studies have suggested factors predisposing to aneurysm rupture as well as risks of elective aneurysm repair. A clinical tool was recently developed to weigh benefits of repair against treatment risks. We evaluate its performance against real-world clinical decisions made by a cerebrovascular multidisciplinary team (MDT). *Methods:* Chart review of all patients with unruptured intracranial berry aneurysms (UIA) discussed at cerebrovascular MDT rounds 2008-2015. Management decisions and clinical outcomes were recorded. The Unruptured Intracranial Aneurysm Treatment Score (UIATS) was calculated for each patient (each aneurysm in the case of multiple UIA). *Results:* We identified 240 patients with a total of 279 aneurysms. UIATS recommended aneurysm repair in 79 cases, conservative management in 88 cases, and was equivocal in 112 cases. Where the UIATS gave a clear decision, that decision was concordant with the MDT decision in 119/167 cases (71%). Discordant decisions often related to the presence of comorbidities. Clinical outcomes did not differ in cases where the recommendations were clearly concordant vs. discordant. *Conclusions:* The UIATS may provide guidance to non-expert clinicians. It did not outperform the MDT.

Multidisciplinary - Other

P.053

Development of an EEG curriculum for icu nurses to facilitate real time screening of continuous EEG data for seizures in critically ill adults

JA Kromm (Calgary) J Waechter (Calgary) A Kramer (Calgary)*

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Background: Nonconvulsive seizures (NCSz) occur commonly in critically ill patients and are harmful. Diagnosis requires detection with continuous electroencephalography (cEEG) that necessitates frequent interpretation by experts. This is often not possible, and requires large amounts of resources. Screening level interpretation of cEEG by ICU nurses to facilitate timely expert diagnosis may be one solution. *Methods:* Kern's approach to curriculum development was utilized to inform creation of a cEEG curriculum for ICU nurses. *Results:* A needs assessment revealed 80%, 94%, and 100% of nurses lacked comfort in basic seizure/EEG principles, EEG and CDSA interpretation respectively. The most requested method of learning (76%) involved simulation. A spiral curriculum of 15 interactive online tutorials with corresponding practice/simulation modules providing instant feedback was developed. To evaluate curriculum impact, time spent on modules, improvement in nursing knowledge, and diagnostic accuracy will be evaluated using pre and post curriculum tests. Participant satisfaction will be evaluated using electronic surveys. *Conclusions:* Development of a curriculum to teach ICU nurses basic screening diagnostic skills for NCSz is possible. Moving forward, we hope to refine and validate this learning tool and formally implement its use to help screen for NCSz prior to expert interpretation.