P.093

Hemoglobin values, fluctuations from baseline, and transfusion as predictors of outcome following aneurysmal subarachnoid hemorrhage

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Background: Anemia following aneurysmal subarachnoid hemorrhage (aSAH) has been associated with poor outcome, but complications from transfusion have limited aggressive management of anemic patients. This study examined the relationship between hemoglobin levels, transfusion and outcome following aSAH. **Methods:** We performed a post-hoc analysis of the CONSCIOUS-1 trial. Poor outcome was defined as a 3-month modified Rankin Scale > 2. Minimum hemoglobin levels were evaluated as predictors of outcome using logistic regression analysis, ROC curve analysis, and LOWESS curves. Propensity score matching was used to assess the effect of transfusion on poor outcome in patients with minimum hemoglobin levels between 70-90 and 80-100 g/L. **Results:** Lower minimum hemoglobin levels were associated with poor outcome on both univariate ($p<0.001$) and multivariate ($p=0.012$) analysis. Area under the ROC curve for minimum hemoglobin was 0.673. Youden index analysis found a minimum hemoglobin threshold of 91.5 g/L maximally predictive for good functional outcome. Propensity score matching showed a trend towards poor outcome in transfused patients with minimum hemoglobin levels between 70-90 and 80-100 g/L ($p=0.052$ and 0.09). **Conclusions:** This work suggests that decreasing hemoglobin is an independent predictor of poor outcome following aSAH. However, there was a trend towards poor outcome in transfused patients. The optimal transfusion threshold should be evaluated by prospective trials.

P.094

Characterizing post-stroke autonomic functioning. sub-study protocol of the clinical arm of PARADISE study

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Background: Strokes can cause a variety of cardiovascular complications. The underlying mechanisms are largely unknown but there is evidence that dysautonomia plays a role in stroke induced-heart injury (SIHI) and arrhythmias triggered by damage of specific brain regions involved in the autonomic regulation of cardiac functions. Understanding these mechanisms could aid in preventing these cardiovascular consequences. We hypothesize that compared to patients with sinus rhythm (SR) or with cardiogenic atrial fibrillation known before the stroke (cKAF) or diagnosed after the stroke (cAF-DAS), those with neurogenic AFDAS (nAFDAS) will show a specific pattern of autonomic functioning. **Methods:** We will prospectively evaluate 200 ischemic stroke patients at the London Health Sciences Center University Hospital. Participants will undergo continuous electrocardiographic monitoring during 14 days. Based on pre-specified criteria, patients with AFDAS will be classified into presumably neurogenic vs cardiogenic. We will assess autonomic function within 14 days after stroke onset by using the Autonomic Reflex Screening. We will compare markers of cardiac dysfunction with autonomic changes, as well as specific stroke topographies for SR, cKAF, cAF-DAS, and nAFDAS. **Results:** We are currently performing an interim analysis. **Conclusions:** Characterizing the autonomic changes that occur after ischemic stroke and their relationship with heart injury will help to advance knowledge on the pathophysiology of SIHI.

P.095

Holey Spinal Cord - A case of spinal cord stroke secondary to fibrocartilaginous embolism

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Background: Fibrocartilaginous embolism (FCE) is a rare reported cause of spinal cord infarction and likely underdiagnosed due to clinical unfamiliarity. FCE can present after a mild trauma and is characterized by back or neck pain along and a rapidly progressive myelopathy. We present a case of FCE and discuss how this clinical entity can break the typical rules of stroke. **Methods:** Case presentation **Results:** An otherwise healthy, 56-year-old professional sports coach presented a couple day history of progressive leg paresthesias and mild back pain, followed by unsteady gait and then inability to void. The left leg demonstrated mild weakness, hyperreflexivity, ataxia and an upgoing plantar response. The right leg became spastic and he then developed bilateral impairment of vibration and proprioception at the toes. An initial limited MRI lumbar spine was negative. A repeat MRI spine showed mild diffusion restriction of T10-11 and T11-12 and evidence of a bone infarct L2. He was diagnosed with a spinal cord infarct secondary to FCE. **Conclusions:** FCE should be considered in the differential for acute myelopathy. It can present with a progressive nature like transverse myelitis and MRI may be non-diagnostic. As more cases are being reported, FCE is becoming better defined and recognized.

P.096

Iatrogenic pseudoaneurysm of the MCA secondary to VP shunt insertion

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Background: Ventriculoperitoneal (VP) shunting is a common treatment for hydrocephalus. Complications of VP shunt include infection, malfunction, and hemorrhage. Vascular complications such as pseudoaneurysm are rare, and usually involve the choroid plexus or branches of the external carotid artery. We present the case of a fusiform pseudoaneurysm of the middle cerebral artery arising due to VP shunt insertion. **Methods:** A 36-year-old female presented with a hypertensive cerebellar hemorrhage and hydrocephalus. This was treated with VP shunt placement with limited dural opening. Three weeks afterward there developed a diffuse intraventricular hemorrhage associated with hemorrhage at the cortical insertion site of the ventricular catheter. CT and catheter angiography revealed a fusiform pseudoaneurysm of the M4 segment of the MCA immediately adjacent to the ventricular catheter. **Results:** The VP shunt was removed, and the aneurysmal segment was coagulated and occluded. Delayed repeat VP shunt insertion was performed through the same entry point and trajectory via a larger dural opening. **Conclusions:** Pseudoaneurysm formation secondary to catheter insertion is a rare

complication. To our knowledge, this is the second reported case of a cortical branch pseudoaneurysm in an adult. Careful consideration should be given to vascular anatomy when planning shunt insertions, and cruciate dural opening for local cortex visualization may help avoid this complication.

P.097

Subarachnoid hemorrhage associated with a thromboembolic ischemic stroke- an unexpected observation

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Atherosclerosis is a significant risk factor for ischemic stroke, and is a frequent cause for extra- and intra-cranial vessels stenosis. Here, we present an unusual case of ischemic stroke associated with intra-cranial vessel stenosis and subarachnoid hemorrhage (SAH) secondary to carotid artery atheroma. A 64-year old female known for hypertension and dyslipidemia presented with a three-day history of three transient episodes (< 30 minutes) of dysarthria and right hand weakness. An initial brain CT scan revealed left frontal SAH. She was admitted to our Stroke Unit for observation and management. CT-angiogram revealed 90% ICAs stenosis bilaterally with several short focal stenotic lesions, involving several left MCA branches. Brain MRI revealed acute infarcts in the left insula, external capsule and inferior frontal gyrus. The clinical picture was attributed to a thromboembolic left MCA ischemic stroke. She was managed with maximum medical therapy, and later underwent successful left carotid endarterectomy. The presence of SAH on our patient's presenting CT scan lead to an initial radiological diagnosis of RCVS. However, subsequent imaging studies indicated that SAH had occurred in association with a thromboembolic ischemic stroke. Despite its rarity, this clinical association is important to recognize to avoid diagnostic confusion and guide appropriate management.

P.098

Primary closure versus expansile patch angioplasty for carotid endarterectomy: a single center series

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Background: Carotid endarterectomy (CEA) is a common treatment option for patients presenting with carotid stenosis; however, the optimal method for arterial closure remains unclear. Therefore, we examined our single center series to compare primary closure versus patch angioplasty for carotid endarterectomy. **Methods:** We reviewed all patients who underwent CEA from 2008 to 2016. Closure method was entirely based on the surgeon style (i.e., all patients treated by vascular surgeons underwent patch angioplasty and all individuals managed by neurosurgeons undergone primary closure). Data were reported as frequencies and outcomes as odds ratios (ORs) with corresponding 95% confidence intervals (CIs). **Results:** A total of 713 patients were included (349 in the primary closure group and 364 in the patch group). Underlying baseline characteristics were similar between both groups. The risk of transient ischemic attack (OR, 7.08; 95%CI, 0.41-2.84; P=0.872), stroke (OR, 1.14; 95%CI, 0.58-2.22; P=0.697), myocardial infarction (OR, 1.10; 95% CI, 0.39-3.07; P=0.851), cranial nerve palsy (OR, 1.79; 95%CI, 0.65-4.91; P=0.248), and post-operative neck hematoma (OR, 1.04; 95%CI, 0.48-2.24; P=0.923) didn't differ significantly between the two closure options. **Conclusions:** Our findings suggest that primary closure and expansile angioplasty have similar safety and efficacy profiles as treatment closure options among patients undergoing CEA.

P.099

Specialty centres for MVD surgery

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Background: The aim of this study is comparing the waiting time and patient's satisfaction of microvascular decompression (MVD) surgery between local Manitoba (MB) and out of province (OOP) patients, treated at our Centre for Cranial Nerve Disorder (CCND). **Methods:** Data from 100 consecutive patients (average age: 56.8±10.6 years), undergoing MVD surgery for Trigeminal Neuralgia (TN) and Hemifacial Spasm (HFS) were reviewed. The outcome measures included the time intervals between disease onset, diagnosis and referral to CCND, postoperative discharge, satisfaction with surgical outcome and referral process. **Results:** The preoperative time leading to CCND referral were longer for OOP patients, (onset to diagnosis/diagnosis to referral: 2.6±3.8/4.2±4.7 (OOP) versus 1.2±2.1/2.5±4.1 (MB) years; p=0.04/0.04), and referrals were more likely self-directed in OOP patients (62% (OOP), 21% (MB); p=0.007). Postoperative satisfaction with MVD outcome were 8.6/10 for OOP and 8.3/10 for MB patients. There was no significant difference in postoperative length of stay (38±*50* (OOP)/43±42 (MB) hours); however, OOP patients were more likely discharged on the first postoperative day (58% (OOP), 31% (MB); p=0.17). **Conclusions:** Delays in diagnosis and surgical referral of TN/HFS are common, and many patients seek specialist's opinion in high volume surgical centers. For those OOP patients, travelling for treatment, MVD outcome were at least as good as for local patients.

P.100

Endovascular Thrombectomy (EVT) for stroke: experience in a Canadian teaching hospital

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Background: EVT is now recommended as standard of care for stroke in Canada, but its implementation still poses challenges. We studied the delivery of EVT in our hospital, a participanting site in the ESCAPE trial, which serves the province of Nova Scotia. **Methods:** Patients who underwent EVT December 2011 – December 2016 were identified prospectively. Demographics, process measures, imaging characteristics (Alberta Stroke Program Early CT Score [ASPECTS], collateral score, Thrombolysis in Cerebral Infarction [TICI] score), and outcomes, including modified Rankin score [mRS] ~ 90 days post-EVT, were collected retrospectively. Effectiveness was assessed by comparison with outcomes in the ESCAPE trial. **Results:**