

P.111**Plasma ADAM-10 as a novel biomarker for traumatic brain injury and concussion***A Persad (Saskatoon)* C Taghibiglou (Saskatoon)*

doi: 10.1017/cjn.2019.204

Background: Cellular prion protein (PrPC) is a lipid raft protein localizing within CNS tissue. It is regulated by a disintegrin and metalloproteinase domain containing protein 10 (ADAM10), which induces ectodomain shedding. PrPC has been previously implicated as a potential biomarker for TBI, but no prior studies have examined the potential of ADAM10 as a biomarker. **Methods:** Serum samples from patients admitted for TBI were collected and patient data was recorded. Control serum was acquired from a commercial tissue bank. Patient GCS was recorded during admission. Serum was used for ELISA to assess PrPC and ADAM10 expression. GraphPad was used to conduct ANOVA and regression analysis. **Results:** 37 control and 20 TBI samples were collected. Of the TBI patients, 8 were mild, 3 were moderate, and 9 were severe clinical grade. Both PrPC and ADAM10 were elevated in TBI patients compared with control ($p < 0.001$). ADAM10 exhibited a dose response, with greater expression in patients with higher clinical grade. There was no significant association of either PrPC or ADAM10 with time after injury. **Conclusions:** Our results indicate that PrPC and ADAM10 may be useful tools for screening of TBI. ADAM10 is associated closely with clinical grade, and may in the future represent a promising prognostic tool.

P.112**Permanent isolated micrographia from traumatic basal ganglia injury***A Persad (Saskatoon)* V Mehta (Edmonton)*

doi: 10.1017/cjn.2019.205

Background: Micrographia is a rare neurological finding in isolation. Most cases of isolated micrographia have been found in association with focal ischemia of the left basal ganglia. **Methods:** We present a case of post-traumatic micrographia stemming from contusion to the left basal ganglia. We performed a detailed analysis of the patient's writing at three-year follow-up. **Results:** A healthy 15 year old male was admitted following a BM accident. CT showed contusion to the left basal ganglia/external capsule. MRI was negative for underlying lesion. He had a short stay in the ICU and then was discharged. Two years later, he expressed concern regarding difficulty with s/m, cramped writing at school. Writing analysis revealed micrographia with spontaneous printing as well as printing to dictation, but not with copied English nor Japanese writing. **Conclusions:** Isolated micrographia is a rare neurological finding. We present the incidence of this symptom following gliding contusion to the left basal ganglia and external capsule.

**NEUROVASCULAR, STROKE AND
NEUROINTERVENTIONAL****P.113****Case series, systematic review and meta-analysis of basilar bifurcation aneurysms treated between 2001 – 2017***C Dandurand (Vancouver)* S Prakash (Vancouver) A Sepehry (Vancouver) K Tourigny (Vancouver) CS Haw (Vancouver) PA Gooderham (Vancouver) G Redekop (Vancouver)*

doi: 10.1017/cjn.2019.206

Background: In aneurysms overall, a lower rate of recanalization in stent assisted coiling vs coiling alone has been observed without an increase in morbidity. This study aims to stratify and compare degree of occlusion outcome by treatment modalities. Secondly, this study aims to stratify and compare postoperative adverse events. **Methods:** MEDLINE and EMBASE databases were searched. Study center were reviewed for inclusion. We performed meta-regressions, bias analysis and fail-safe N. We controlled for the quality of the studies. **Results:** 396 nonduplicated patients were separated into 4 groups: microsurgical, stent-assisted coiling, coiling, stent only. Stent-assisted coiling has lower rate of retreatment (17 vs 24%) and higher rehemorrhage (5% vs 3%) compared to coiling. Stent-assisted has higher rates of complete occlusion (55% vs 45%) and lower rate of residual aneurysm (15% vs 23%) compared to coiling. Comparative analyses were performed. Microsurgical remained the most morbid modality with the best rate of complete occlusion (93%) and lowest rehemorrhage (2%) and retreatment rate (5%). **Conclusions:** This is the first and largest meta-analysis focusing on patients treated for basilar apex aneurysm. To our knowledge, this is the first study to stratify and compare degree of occlusion per treatment modality. This study provides benchmark numbers to guide clinicians.

P.114**Headache outcomes after treatment of unruptured intracranial aneurysms: systematic review and meta-analysis***C Dandurand (Vancouver)* H Parhar (Vancouver) F Naji (Hamilton) S Prakash (Vancouver) PA Gooderham (Vancouver)*

doi: 10.1017/cjn.2019.207

Background: Headaches are a major cause of disability and healthcare cost worldwide. When investigating headaches etiology, incidental unruptured intracranial aneurysms are often considered unrelated. We conducted a systematic review and meta-analysis to assess headache outcomes (severity) after treatment of unruptured intracranial aneurysm. **Methods:** MEDLINE and EMBASE were systematically reviewed. **Results:** The data from eligible studies ($n=7$) was extracted and analyzed. 309 nonduplicated patients provided patient-level data for analysis. All studies used the 10-point numeric rating scale (NRS). 88% of patients were treated with endovascular technique. Overall, the observed effect estimate under a random effects model was found to be a standard mean difference in pre- and post-intervention headache severity of -0.448 (95% CI: -0.566 to -0.329). No significant heterogeneity was noted. No significant publication bias was demonstrated. **Conclusions:** This is the

first and largest systematic review assessing postoperative headache outcomes after treatment of unruptured intracranial aneurysm. A significant reduction in headache intensity after treatment is observed in the current published literature. This study highlights an interesting clinical phenomenon that still warrants scientific effort before it can influence clinical practice. We encourage future study to stratify headache outcomes by aneurysm size, location and treatment modality.

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Saskatchewan experience with mechanical thrombectomy under general anaesthesia

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doi: 10.1017/cjn.2019.208

Background: While recent clinical trials have demonstrated immense efficacy of mechanical thrombectomy (MT) in the setting of acute stroke, there remains debate over the safety in performing this procedure under general anesthesia (GA). In the Saskatchewan Acute Stroke Pathway, all patients presenting with LVO have endovascular thrombectomy performed under GA. **Methods:** Data was retrospectively reviewed on 108 consecutive LVO in 2016-2017. All MT were done under GA. Anatomical location of LVO, pre-MT ASPECTS score, post-MT TICI scores and 90-day NIHSS and mRS were recorded. **Results:** Of 108 LVO, 103 went on to have MT. 44 were right anterior circulation, 50 were left anterior circulation and 9 were posterior circulation. Of 94 anterior circulation strokes, 47 (50.0%), 43 (45.7%) and 4 (4.3%) had good, moderate and poor collateral circulation respectively, and the average pre-MT ASPECTS was 8.6. The average pre-MT NIHSS was 14.7. 81/90 (90.0%) achieved thrombolysis in cerebral infarction (TICI) perfusion scale grade of 2b/3 after recanalization. Average documented 90-day NIHSS was 2.4 and mRS was 2.5. Overall mortality was 21/103 (20.4%). **Conclusions:** In the Saskatchewan acute stroke pathway, general anesthesia is a safe modality for MT. This adds to the body of evidence supporting GA as a viable option for sedation in MT.

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Predicting cerebral vasospasm following aneurysmal subarachnoid hemorrhage is still an imperfect science

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doi: 10.1017/cjn.2019.209

Background: Cerebral vasospasm is a leading cause of neurological disability following aneurysmal subarachnoid hemorrhage (aSAH). Clinical features associated with vasospasm development include blood burden on CT, neurological status, age and aneurysm location. Early cerebral CT perfusion (CTP) scanning in aSAH may be an independent predictor of vasospasm and/or delayed cerebral ischemia (DCI). **Methods:** Forty-one patients with aSAH were prospectively enrolled. Baseline data collected included WFNS grade, loss of consciousness at ictus, and modified Fisher grade. CTP was obtained at baseline and on day 6 post SAH. Cerebral blood volume, cerebral blood flow and mean transit time were measured. DCI was confirmed by a combination of clinical assessments, non-contrast CT and CTP. Radiological vasospasm was assessed with

CT angiography. **Results:** Despite 80% of patients having a modified Fisher grade 3 or 4 aSAH, one-third presenting with ictal LOC and half having anterior communicating artery aneurysms, only one patient developed clinical evidence of vasospasm/DCI. Two others had asymptomatic radiological vasospasm. CTP parameters did not differ between groups defined by clinical predictors. **Conclusions:** In an unexpected finding, clinical and radiological vasospasm were very uncommon in this cohort. Clinical predictive variables correlated poorly with development of vasospasm. CTP may help refine the model but further work is needed.

OTHER NEUROSURGERY

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The opinion of Canadian spine surgeons on medical assistance in dying (MAID); a cross-sectional survey of Canadian spine society (CSS) members

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doi: 10.1017/cjn.2019.210

Background: On February 6, 2015, the Supreme Court of Canada struck down the Criminal Code absolute prohibition on assisted dying, and in June 2016 the new law, Bill C-14, came into effect allowing for medical assistance in dying. We sought to determine the attitudes and opinions of Canadian neurosurgeons and orthopedic spine surgeons regarding MAID. **Methods:** A cross-sectional survey was sent out to members of the Canadian Spine Society (CSS), which included 21 questions pertaining to opinions regarding MAID. Responses were collected between May-June 2016. **Results:** A total of 51 surgeons responded to the survey, comprised of a mix of spine surgeons from across the country. The majority of surgeons supported MAID (62.8%), and right of physicians to participate (82.4%). Most surgeons supported the right to conscientious objection (90.1%), but also mandatory duty to refer (49.0%). The conditions most frequently felt to be appropriate for MAID included metastatic spine tumour (76.5%), malignant intramedullary tumour (64.7%), primary malignant spine tumour (54.9%), cervical spinal cord injury with tetraplegia (49.0%) and multiple myeloma (33.3%). **Conclusions:** This study highlights the complex landscape that exists when discussing MAID, but also the overall support of physicians, and need for ongoing conversations, particularly with issues not addressed by the current legislation.

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Excalibur, a novel haptic hand-controller for robot-assisted microsurgery

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doi: 10.1017/cjn.2019.211

Background: For robot-assisted telesurgery, the workstation, in particular the haptic handcontroller itself a robot, is paramount to the performance of surgery. Based on the requirements for microsurgery, a novel haptic handcontroller *Excalibur* has been developed. **Methods:** Thirty-two surgeons performed a peg-in-hole task (simulating micro-