E-055 FULLY ENDOSCOPIC CLIPPING OF ANTERIOR CIRCULATION ANEURYSMS: A SURGICAL STEP CLOSER TO ENDOVASCULAR BENEFITS?

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Introduction Advancement of endovascular treatment modalities with pipeline flow diversion, stenting, and coiling for aneurysms has pushed against the frontier set by open surgical clipping and bypass. Endovascular treatment has historically shown a lower risk profile, lower readmission rates with certain procedures, and a more favorable cosmetic result, pushing centers to perform a greater proportion of procedures endovascularly. With our cases of fully endoscopic clipping of anterior circulation aneurysms through minimally invasive keyhole craniotomies, we exhibit open neurosurgery's potential transition to "new" standards for absence of cosmetic defects, a less invasive approach, and less exposure to radiation.

Case Presentations A 67-year-old female presented with persistent headaches, and was found to have an unruptured, right MCA bifurcation aneurysm upon CTA examination. The next, a 45-year-old patient, also with persistent headaches, was found to have an unruptured ICA aneurysm. Both lack significant comorbidities and report being previously healthy. Fully endoscopic treatment through a transpalpebral incision was elected to be used to treat both unruptured aneurysms.

Results No intra-operative complications were experienced, and the surgical field remained well-visualized throughout the procedure with the endoscope. Patients remained neurologically and hemodynamically stable during and after surgery, there were no post-operative complications. Postoperative imaging showed adequate clipping of the aneurysms. The patients both had minimal cosmetic defects.

Conclusion The use of a fully endoscopic approach shows potential for improving the quality of care through reduced operative time, lower complications, and improved craniofacial aesthetic to the patient. We believe that fully endoscopic clipping of select non-ruptured aneurysms is a safe and effective alternative surgical option that can be performed through minimally invasive approaches with a lower risk profile and favorable cosmetic result, potentially comparable to that of endovascular treatment.

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E-056 ANATOMICAL FINDINGS AT THE CIRCLE OF WILLIS AND CERVICAL CAROTID ARTERIES DURING LARGE VESSEL OCCLUSION STROKE: OBSERVATIONS FROM COMPUTED TOMOGRAPHY ANGIOGRAPHY

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Objective The circle of Willis (CoW) and cervical carotid arteries are potentially important sources of collateral flow (or flow limitation) during acute large vessel occlusion (LVO) in the anterior circulation. We sought to examine the anatomical components of the circle and the cervical carotid arteries to

determine whether they bear any relationship to acute stroke severity.

Methods Consecutive patients with acute LVO who underwent endovascular thrombectomy (EVT) between September 2018 and June 2019 were assessed using computed tomography angiography (CTA). Measurements were made of the luminal diameters of 16 anatomical vascular components of the CoW and neck. Measures of stroke severity, including the admission NIHSS, ASPECTS and mCTA collateral scores, were statistically analyzed for any relationship to vascular measurements.

Results One hundred patients (51 men, 49 women) between 32 and 99 years of age (mean 72.3 years) were studied. No relationship was found between the anterior or posterior collateral Willis pathways and measures of stroke severity. On the other hand, the ophthalmic arteries did exhibit a relationship to stroke severity. In adjusted analysis, a 1-mm increase in the ipsilateral and contralateral ophthalmic artery diameter was independently associated with a 4.80-point decrease (95% CI: 1.26, 8.34) and a 6.31-point increase (95% CI: 0.27, 12.36) in the NIHSS scale, respectively. Similarly, 1-mm increases in the ipsilateral and contralateral ophthalmic artery diameter were respectively associated with a 1.53-point increase (95% CI: 0.66, 2.41) and a 2.62-point decrease (95% CI 1.12, 4.13) in the ASPECTS. In the neck, ipsilateral carotid artery analysis showed a majority with 0% stenosis, and unexpectedly no NASCET stenosis between 55% and 95%, while a minority (14%) were 95% to 100%.

Conclusions Stroke severity and native collateral during LVO is unrelated to circle of Willis anatomy. Ophthalmic artery calibers show some relationship to stroke severity. Our findings also support the notion of acute progression of moderate and severe NASCET stenoses to near occlusion or complete occlusion at the onset of LVO stroke, such that no cases exhibited moderate or severe 55-95% narrowing.

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E-057 PROSPECTIVE PREHOSPITAL EVALUATION OF VAN AND RACE LARGE VESSEL OCCLUSION PREDICTION INSTRUMENTS ON A MOBILE STROKE UNIT

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Background and Purpose A variety of large vessel occlusion (LVO) prediction instruments have recently been developed with the intention of appropriately routing patients to either the closest hospital, or to a hospital capable of performing endovascular thrombectomy. However, there is currently a scarcity of prospective data validating these instruments in the field. This study directly compares the efficacy of two instruments, the Rapid Arterial Occlusion Evaluation (RACE) scale, and the Vision, Aphasia, Neglect (VAN) screening tool.

Methods VAN and RACE were concurrently evaluated by the same observer on each patient transported by our mobile stroke unit (MSU). LVO status was determined by computed tomography angiography, magnetic resonance angiogram, or digital subtraction angiography within 24 hours. To compare the ability of VAN and RACE to detect LVO, we calculated their sensitivity, specificity, positive and

negative predictive values (PPV, NPV) and area under the ROC curve (AUC).

Results In our cohort of 105 patients, 18 (17%) had an LVO. VAN was found to have a sensitivity of 0.56, specificity of 0.77, PPV of 0.33, and NPV of 0.89 in predicting LVO, with an AUC of 0.663. RACE demonstrated a sensitivity of 0.67, specificity of 0.79, PPV of 0.40, and NPV of 0.92, with an AUC of 0.730. In patients with time since last known well (LKW) of ≤ 1.5 hours ($n = 42$), VAN and RACE both demonstrated superior performance and high NPV (VAN NPV = 0.93, RACE NPV = 0.96).

Conclusions Both VAN and RACE demonstrated measurable but limited benefit in predicting LVO in the field. In patients with LKW times of ≤ 1.5 hours, RACE showed a high NPV of 0.96. In this subset of patients, RACE could be used to rule out LVO in the prehospital setting, avoiding delays in care due to unnecessary transport to a thrombectomy-capable facility.

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E-058

CAROTID ARTERY STENTING USING BALLOON-GUIDE CATHETER FOR PROXIMAL OCCLUSION AS DISTAL EMBOLIC PROTECTION

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Background Distal embolic protection is an important and required component of carotid artery stenting (CAS). Data around distal protection devices (DPD), however, are limited. Here, we evaluate the safety and efficacy of proximal occlusion using balloon guide catheter (BGC) as the primary method of distal embolic protection during CAS.

Methods We conducted a retrospective review of patients undergoing CAS at our healthcare system between January of 2018 to January of 2021. We included patients who received CAS with a balloon-guide catheter being utilized for embolic protection through the inflation of its balloon proximal to the stenotic portion of the cervical internal carotid artery. Following angioplasty and stent deployment, aspiration through its working lumen was performed prior to balloon deflation, for distal embolic protection using flow reversal. Symptomatic patients with emergent CAS were defined as patients receiving CAS in <24 hours of presentation for ischemic stroke or TIA ipsilateral to the disease location. Periprocedural ischemic stroke was defined as acute focal neurological symptoms lasting for ≥ 24 hours following the procedure that was consistent with focal cerebral ischemia ipsilateral to CAS side.

Results A total of 91 CAS procedures were performed during the study period on 87 eligible patients (age 45-93 years), and 65% ($n=57$) were males. All procedures were done under proximal BGC protection. In 24 (26.3%) of cases, a DPD was used in conjunction with the BGC. Severe carotid stenosis cases (as per NASCET criteria) was present in 80.2% ($n=73$) of patients. Non-emergent CAS

for symptomatic carotid disease accounted for 61.5% ($n=56$), while emergent CAS placement for symptomatic carotid disease was 28.6% ($n=26$). The remaining 9.9% ($n=9$) CAS patients were asymptomatic. Balloon angioplasty was performed in 95.6% ($n=87$) cases with 41.7% ($n=38$) receiving pre-stenting angioplasty, 15.4% ($n=14$) receiving post-stenting angioplasty, and 38.5% ($n=35$) receiving both pre and post stenting angioplasty of the total number of performed procedures. Periprocedural ischemic strokes complication were identified in 3.3% ($n=3$) of all cases.

Conclusion Our study indicates a low periprocedural ischemic stroke development following the use of proximal occlusion as the distal embolic protection strategy with BGC in CAS.

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E-059

EPTIFIBATIDE BRIDGING THERAPY FOR STAGED CAROTID ARTERY STENTING AND CARDIAC SURGERY

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Background Prophylactic carotid artery stenting (CAS) is an effective strategy to reduce perioperative stroke in patients with severe carotid stenosis who require cardiothoracic surgery (CTS). Staging both procedures (CAS-CTS) during a single hospitalization presents conflicting demands for antiplatelet therapy and the optimal pharmacologic strategy between procedures is not established. Eptifibatide (Integrellin), a parenteral GP IIb/IIIa antiplatelet agent with a half-life of 2.5 hours, is an appealing alternative to oral thienopyridines, enabling rapid reversal prior to sternotomy. The purpose of this study is to present our initial experience with a "bridging" eptifibatide protocol for staged CAS-CTS.

Methods A retrospective review of staged CAS-CTS procedures at a single referral center was performed. All patients had multivessel coronary and/or valvular disease and severe carotid stenosis ($>70\%$) confirmed during preoperative risk assessment. Per the institutional protocol (figure 1), all patients not previously on aspirin were also started on aspirin prior to surgery, followed by eptifibatide during CAS (intraprocedural bolus followed by post-procedural infusion which was continued until the morning of surgery). Pre- and perioperative (30 days) neurologic morbidity and mortality was the primary endpoint.

Results 11 CAS procedures were performed in ten patients using the protocol. The median duration of eptifibatide bridge therapy was 36 hours (range 24-288hrs). There was one minor bleeding complication (1/11, 9.1%) and no major bleeding complications during the bridging and post-operative period. There was one post-operative, non-neurologic death and zero perioperative ischemic strokes.

Conclusions For patients undergoing staged CAS-CTS, Eptifibatide bridging therapy is a viable temporary antiplatelet strategy with a favorable safety profile. This strategy enables a flexible range of time-intervals between procedures.