SUBOCIPITAL PUNCTURE: A LOST ART?


Access to the subarachnoid space has both diagnostic and therapeutic implications. A multitude of routes have been described, including lumbar, lateral atlanto-occipital, and suboccipital puncture for access to the cisterna magna. Suboccipital puncture, a now seemingly archaic technique, was initially popular and widely implemented in the early 20th century due to the capacious foramen magnum and outstanding safety profile. Lumbar puncture eventually replaced the former due to the ease of access, decreased risk of catastrophic injury, and reliability of access without image guidance. However, there is now a growing body of literature which clearly demonstrates that therapeutic delivery via suboccipital puncture results in superior cortical and cervical spine exposure when compared to lumbar puncture. This is germane for a number of congenital and acquired diseases which could potentially be treated with adeno-associated virus (AAV) gene therapy as well as other treatment modalities. The suboccipital approach can also serve as a viable alternative for diagnostic CSF access in those cases in which the lumbar and C1-C2 approaches are contraindicated or not possible for anatomic reasons. Herein, we describe a modernized iteration of the suboccipital approach under image guidance which with appropriate training can readily be added to the armamentarium of spinal interventionists for an alternative route of CSF access as well as therapeutic delivery.

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MIDDLE MENINGEAL ARTERY EMBOLIZATION AS A SAME-DAY DISCHARGE PROCEDURE


Methods A retrospective analysis of patients who underwent MMAE for cSDH at the University of California, San Diego was performed. Data collected included post-procedural complications such as focal neurologic deficit, cognitive decline, and groin access-point hemorrhage identified within the first 4 hours, 24 hours, and delayed manner respectively. Success of treatment was defined as patient stability and return to baseline following the post-procedure assessment protocol performed routinely at our institution. We further characterized patients with the Charlson Comorbidity Index (CCI) to identify higher risk populations that would require increased observation. The CCI was also used to determine a cut-off point for same-day discharge eligibility.

Results We analyzed data from 95 patients that had 143 subdural hematomas treated at our institution. Of the 95 patients, 93 patients (98%) had no complications following our institution’s standardized assessments after MMAE or at discharge the following day. Average SDH size was 12.9mm. Twenty-one patients underwent surgical drainage after MMAE. Following MMAE, two patients presented complications; one patient, an 83-year-old female, developed transient headache and blurry vision one day after MMAE and was discharged uneventfully; this patient had a CCI of 4 points. The other patient was a 77-year-old male with metastatic prostate carcinoma and had an SDH volume expansion one day after the procedure which required operative intervention with burr-hole craniotomy and drainage; this patient had a CCI of 9 points (0% estimated 10-year survival). The remaining 93 patients suffered no complications after MMAE.

Conclusion Time-effectiveness and low complication rates make MMAE an ideal same-day procedure for patients with cSDH and a low CCI score. The grand majority of patients had no complications following MMAE, suggesting a large patient population that may benefit from the same-day procedure aspect of intervention. Although some patients underwent planned surgical drainage, the embolization component of management was uneventful. Our analysis provides evidence that MMAE could develop into an ambulatory procedure in patients with cSDH and a low comorbidity profile; this could have economic benefits for both the patients requiring and the institutions offering the procedure. Further prospective studies are needed to strengthen these findings.


OPTICAL COHERENCE TOMOGRAPHY-GUIDED ENDOVASCULAR TREATMENT OF SYMPTOMATIC NON-STENOTIC CAROTID DISEASE

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Introduction Symptomatic non-stenotic carotid disease (SyNC) is an underrecognized etiology of cryptogenic ischemic stroke. Maximal medical therapy has limited efficacy against SyNC patients with certain plaque features. Endovascular treatment of SyNC in conjunction with multimodal imaging technologies is an unexplored frontier. We present a brief report of a case of SyNC that was endovascularly treated and guided by optical coherence tomography (OCT).
Materials and Methods A 74-year-old male with history of remote cryptogenic cerebellar stroke presented with self-limited episodes of dysarthria and left hemifield visual loss. Based on his clinical history and clinical examination, a diagnosis of stroke with cardioembolic or unstable atherosclerotic disease origin was made, and imaging was ordered accordingly.

Results Brain magnetic resonance (MR) imaging showed multifocal subacute and chronic right hemispheric infarcts. MR and CT angiography of the neck demonstrated <50% stenosis of the right ICA due to a partially calcified, possibly ulcerated plaque with intraplaque hemorrhage. Baseline OCT images demonstrated a large excavation within an ulcerated ICA plaque and thrombus. Patient was then treated with a carotid artery stenting under flow arrest. Post-stenting OCT confirmed the collapse of the intraplaque lumen by outward radial displacement of the fibrous cap and excellent stent wall apposition without atheroma protrusion.

Conclusion SyNC is increasingly being recognized as a potential etiology in cryptogenic ischemic strokes. Plaques can be evaluated through imaging modalities such as OCT providing insight towards targeted therapy for patients.

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E-132 A RETROSPECTIVE ANALYSIS OF STROKE CODE SPECIFICITY IN PREDICTING ACUTE ISCHEMIC EVENTS

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Background Hospital stroke codes are critically important for early identification and rapid treatment of acute ischemic stroke (AIS). Unfortunately, mimics of AIS are common in clinical practice, and current literature found the specificity in predicting AIS from a stroke code is between 40%-70%. While stroke codes have excellent sensitivity, their low specificity can cause a delay in care and misutilization of resources.

Methods We conducted a retrospective chart review on all stroke codes called during the months of February 2021-July 2021 at MedStar Georgetown University Hospital (MGUH) (n=299). The patient population consisted of individuals being treated by a variety of inpatient services and the Emergency Department (ED). Patients were categorized by their final diagnosis of either AIS/TIA or stroke mimic.

Results The overall accuracy of stroke codes in appropriately predicting an AIS/TIA was 29%, with 39% in the ED and 10% in the inpatient setting. In evaluating stroke mimics, 43.6% were due to toxic metabolic encephalopathy (TME), 9.4% from seizure, 7% from complex migraine, 6.1% from syncope, 6.1% from a functional neurological disorder, 4.7% from hypertensive encephalopathy, and 5.2% from the peripheral nervous system. The other 19% were from other etiologies (stroke recrudescence, non-specific pain, ophthalmologic, or primary movement disorder).

Conclusions This retrospective analysis of stroke codes at MGUH during a 6-month period was 29% specific in predicting AIS. This is significantly lower than what was found in previous studies. Of stroke mimics, TME was the major etiology encompassing 43.6% of cases. The results of our study suggest additional stroke education may be needed for non-neurologists and ancillary staff to appropriately recognize stroke symptoms to better improve the utilization of hospital resources and provide efficient and effective care.


E-133 EVALUATION OF ENDOVASCULAR CATHETER PUSH/PULL FORCES AND ENERGIES WITHIN SILICONE AND GLASS NEUROVASCULAR MODELS WITH IDENTICAL TORTUOSITY

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Introduction This research evaluates force and energy impacts correlated with placement of endovascular catheters into (push) and out (pull) of tortuous neurovascular models of silicone and glass (United Biologics - UB). Three test catheter sizes (Stryker SL-10 1.7F, MicroVention Headway 2.6F, and Medtronic React 68) were placed into the models, using saline (PBS) and UB’s SLIP solution, and compared at room (21°C) and body (37°C) temperatures.

Materials and Methods Push and pull forces were measured by the Bioengineering Devices Lab (BDL) at Northern Arizona University (NAU) using a hybrid rheometer (HR2, TA Instruments). A 3D-printed mounting plate held the lure of an 8F guide catheter under the vertical force plate and provided gradual transition to horizontal placement into the vessel models. The models were connected to a flow system, filled with stroke symptoms to better improve the utilization of hospital resources and provide efficient and effective care.


E-133 Figure 1 Push-pull with 6.3F react 68 aspiration catheter. Top – catheter progression through glass model with 180° curve and 360° loop. Bottom – push forces as the catheter progresses through the loop and curve (distance of 8.5 cm).

Abstract E-133 Figure 1 Push-pull with 6.3F react 68 aspiration catheter. Top – catheter progression through glass model with 180° curve and 360° loop. Bottom – push forces as the catheter progresses through the loop and curve (distance of 8.5 cm).