trending up; however, without attaining statistical significance (p = 0.45).

Conclusion Our nationally represented sample showed no difference in outcomes in medically, and EVT treated groups among gender despite prior literature suggesting poor outcomes in the EVT group. Patient selection for EVT should be individualized based on patient presentation. Our analysis showed CVT treated with EVT hospitalization is trending up in the US.

Disclosures S. Patel: None. N. Desai: None. M. Pervez: None.

Abstract E-006 Figure 1 Left - Hybrid Rheometer. Right - Rheometer Setup for Layered Sample

E-006 NORMALIZATION OF ELEVATED IDIOPATHIC INTRACRANIAL VENOUS PRESSURES AFTER MANOMETRY AND HIGH-VOLUME LUMBAR PUNCTURE IN A PATIENT WITH PSEUDOTUMOR CEREBRI

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Treatment of idiopathic intracranial hypertension (IIH), also known as pseudotumor cerebri, generally prioritizes alleviating headaches and preserving vision. If medical management is unsuccessful, possible surgical treatment options depending on symptom severity include serial lumbar punctures, venous sinus stenting, optic nerve sheath fenestration (ONSF), and cerebrospinal fluid (CSF) shunting. Venous sinus stenting has remained controversial as cerebral vein stenosis may not be a primary cause.

In our case, we present a 38-year-old female with known pseudotumor cerebri who underwent a diagnostic cerebral angiogram with manometry and high-volume lumbar puncture. Pre-lumbar puncture manometry demonstrated venous pressures throughout the left and right transverse sinuses and distal superior sagittal sinus ranging from 25–30 mmHg with associated bilateral transverse-sigmoid junction stenoses. The patient was then placed in the lateral decubitus position and a lumbar puncture at L2-3 was performed. Opening pressure was measured at 29 cm H2O, 30 mL of clear CSF was removed, and closing pressure was measured at 8.5 cm H2O. Post-lumbar puncture manometry demonstrated normalization of respective venous pressures ranging from 8–12 mmHg with resolution of associated bilateral transverse-sigmoid junction stenoses and improved venous sinus calibers. Following the procedure, the patient reported resolution of headache.

These results indicate that cerebral venous stenoses in the setting of IIH may be a secondary phenomenon. Thus, patients may benefit from CSF shunting as a primary surgical treatment option. In order to establish treatment efficacy, future studies could evaluate for stenosis and pressure gradient recurrence after CSF shunting.

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E-006 TUNING OF INNOVATIVE IN-VITRO MODEL MATERIALS TO MIMIC TISSUE PROPERTIES

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Introduction/Purpose In-vitro models help test new medical devices for use in numerous cardiovascular and neurovascular treatments. These models are also commonly used for the training of surgeons on innovate devices and new surgical procedures. These current vessel-training models cast from human vasculature with anatomical accuracy; however the materials often used for casting (i.e. silicone and glass) do not accurately simulate mechanical properties of tissue such as: vascular compliance (modulus), tensile and compressive strength, wall friction (lubricity), and hardness seen in native human vasculature. Thus, a more tunable and comprehensive in-vitro material model is needed to better understand how endovascular devices (i.e. microcatheters/wires, thrombectomy devices, coils, stents, flow diverters, and liquid embolics) interact with the vessel wall during delivery. An innovative 3D printed acrylic co-polymer (VeroClear Agilus30* – VC-A30) can be tuned to match the mechanical properties of human vessels.

Materials and Methods Differing hardnesses of VC-A30 are layered and mechanically characterized with a hybrid rheometer (DHR 2, TA Instruments). The results are compared to replicated test results of donated ‘fresh’ human cadaveric tissue samples (Common Carotid Artery). Via the rheometer, data is collected for luminal wall friction, radial compliance, shear modulus, and elastic modulus (figure 1). Properties of cadaveric vessels and model materials are statistically compared to the VC-A30. The biomaterial layering is altered by varying the thickness of the VC-A30 layer thicknesses (biomaterial tuning) to mimic the mechanical properties of the cadaveric vasculature within statistical equivalence. Once successfully optimized, the biomaterials are manufactured into flow models and will additionally be validated by partnered neurointerventionalists to ensure that the model has realistic catheter trackability and is anatomically accurate.

Results The VC-A30 materials in the previous studies simulated the compliance and mechanical properties of human vasculature more closely than existing in-vitro silicone materials. VC-A30 is 3D printed to achieve accurate anatomical features; moreover, this 3D printed material is layered to simulate the lubricious inner lumen of a vessel, with varying hardness profiles to mimic vessel compliance and strength. This assembled structure simulates the layers of human vasculature and its variable properties.

Conclusion The utilization of novel biomimetic materials within this in-vitro vascular flow model will allow for more relevant benchtop testing of endovascular devices. These models have the potential to generate more accurate data on device performance and may reduce the need for costly in-vivo studies.
**E-007** CHARACTERIZATION OF LIPOCALIN-2 IN ISCHEMIC STROKE BY DISTAL AND PROXIMAL INTRALUMINAL SAMPLING FROM MECHANICAL THROMBECTOMY

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**Introduction** Lipocalin-2 (LCN2) is a protein involved in many cellular processes, including the regulation of iron homeostasis, promotion of protective mechanisms in renal ischemia, and astrocyte activation in ischemic stroke. In some ischemic stroke models, LCN2 has been described as a ‘help me’ signal, leading to the activation of microglia, astrocytes, and drive towards cellular phenotypes favorable of recovery. While some models suggest pro-recovery effects of LCN2, other models illustrate LCN2 as having a critical role in neuroinflammation and reperfusion injury. The possibility of disease state-dependent influence of LCN2 activity in ischemic stroke has been recognized, but has yet to be further characterized.

**Methods** Human plasma samples from thrombectomy patients were processed in the Blood and Clot Thrombectomy Registry and Collaboration (BACTRAC clinicaltrials.gov NCT03153683), and underwent Proximity Extension Assay (PEA) via Olink (Olink Proteomics, Boston, MA). For each protein, intracranial expression distal to the stroke thrombus was compared to the same subject’s systemic arterial blood as an internal control. The percent change of protein expression was calculated as follows: (intracranial distal values-systemic proximal values). Comorbidities and sex difference were analyzed using appropriate one-way comparisons and regression.

**Results** 25 adult patients (> 18 yrs) were included in this initial analysis, of which 15 (60%) were female. Median age was 64 (24–91). 16 patients (64%) had hypertension, 15 patients (60%) had BMI > 25, 10 patients (40%) had a history of smoking, 6 patients (24%) had previous stroke, 4 patients (16%) had hyperlipidemia, and 1 patient (4%) had previous MI. Mean infarct time was 513 ± 246 minutes and mean infarct volume was 58.17 ± 82.28 cc. Of 184 proteins, only 27 demonstrated an increase percent change between intracranial and systemic blood. LCN2 demonstrated a 14% increase change between intracranial and systemic blood, one of the greatest percent increases among measured proteins. The percent change of LCN2 was significantly increased in those with hypertension (p = 0.024) and decreased in those with type-two diabetes (p = 0.04).

**Conclusions** Changes of LCN2 intracranially during stroke were most significant in patients with hypertension and/or diabetes. For the first time, these data provide insight into the human molecular pathology of stroke regarding this protein and its signaling cascade. Future studies will focus on the role of proteins as they relate to radiographic, functional and other clinical outcomes. Proteomic findings coupled with advanced database analysis will elucidate complex cell signaling and biomolecular interactions that occur in the blood at the site of infarct.

**E-008** A NOVEL LIQUID EMBOLIC MATERIAL USING A HYDROPHILIC POLYMER COMPOSITE ACTIVATED BY THE CA2+ IN THE BLOOD: ANGIOGRAPHICAL EVALUATION USING A RABBIT MODEL

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**Introduction** Liquid embolic material (LEM) plays an essential role in the treatment of hemorrhagic stroke caused by arteriovenous malformation or dural arteriovenous fistula. However, currently available non-adhesive LEMs has the problem of catheter entrapment, and also known to have a cytotoxic effect due to the organic solvents such as Dimethyl Sulfoxide (DMSO). The New Generation Liquid Embolic Material (NGLEM) is a clear liquid that immediately forms a solid hydrogel cast upon exposure to Ca2+ in the bloodstream, and organic solvents are not required. The performance of this new liquid embolic material was evaluated using an in vivo experimental model using rabbit.

**Methods** Under general anesthesia, a renal artery of New Zealand rabbit (4.5–5.0 kg) was catheterized under fluoroscopy using a microcatheter, and NGLEM (Aqua Embolic System) was injected into the artery. Following factors were assessed; 1) the amount of LEM required for the complete occlusion, 2) injection speed, 3) duration of the injection, 4) radiopacity during the deployment and 5) incidence of catheter entrapment after the injection.

**Results** 10 renal arteries in 10 rabbits were treated, and all arteries were completely occluded without technical complication. The injected materials immediately formed LEM cast in all vessels followed by the reflux over the microcatheter. All catheters were withdrawn without any sign of catheter entrapment. The NGLEM mixed with tantalum based (10 animals) contrasts medium showed sufficient radiopacity under fluoroscopy. With the injection speed of 0.02 ml/sec, the average volume required was 0.68 ml. Average time for the complete embolization was 4.8 min.

**Conclusions** This new LEM demonstrated a higher radiopacity and lower incidence of catheter entrapment compared to the current liquid embolic materials. It is currently being developed for the treatment of dural arteriovenous fistula and venous malformation or dural arteriovenous fistula. The role in the treatment of hemorrhagic stroke caused by arteriovenous malformation or dural arteriovenous fistula. However, currently available non-adhesive LEMs has the problem of catheter entrapment, and also known to have a cytotoxic effect due to the organic solvents such as Dimethyl Sulfoxide (DMSO). The New Generation Liquid Embolic Material (NGLEM) is a clear liquid that immediately forms a solid hydrogel cast upon exposure to Ca2+ in the bloodstream, and organic solvents are not required. The performance of this new liquid embolic material was evaluated using an in vivo experimental model using rabbit.

**Abstract E-008 Figure 1** A left Renal artery of rabbit was embolized with Aqua Embolic System. A) A Control anglogram was performed. B) and C) The material injected from the catheter filling the distal branches. D) a reflux of the material (red arrow) was seen. E) At the end of the procedure, the tip of the catheter was embedded in the cast of embolic material (blue arrow), which was removed without any resistance.