Background and Purpose Preclinical testing platforms that accurately replicate complex human cerebral vasculature are critical to advance neurointerventional knowledge, tools, and techniques. A more realistic thrombectomy model that can simultaneously and accurately mimic the complex hemodynamics, anatomy and arterial response to thrombectomy devices is largely needed to evaluate and improve thrombectomy devices in the preclinical stage. Here, we introduced and validated a human ‘live cadaveric’ head-and-neck neurovascular model optimized for proximal and distal vascular occlusion and recanalization techniques.

Methods Human cadaveric head-and-neck specimens were cannulated bilaterally in the jugular veins, carotid, and vertebral arteries. Specimens were then coupled with modular glass models of the aorta and extra-cranial carotid arteries, as well as radial and femoral access ports. Intracranial physiological flow was simulated using a flow-delivery system and blood mimicking fluid. Baseline anatomy, histological and mechanical properties of cerebral arteries were compared to that of fresh specimens. Radiopaque clot analogs were emobilized to replicate proximal and distal arterial occlusions, followed by proximal and distal thrombectomy procedures. Experienced interventionalists scored the model on different aspects. The performance of the model was evaluated by semi-quantitative 5-point scale: 5 Equal to patients, 4 Highly realistic, 3 Sufficiently realistic, 2 Not sufficiently realistic, 1 Nonrealistic on aspects such as: anatomy by DSA and roadmap, device performance to navigate intracranially, haptic feedback from device manipulation, arterial response to mechanical loading, fluoroscopic appearance of the devices, and overall similarity to patients.

Results Compared to counterpart fresh human arteries, formalin-fixed arteries showed similar mechanical properties, including maximum stretch (1.49±0.09), increased tensile strength/stiffness (1.33±0.26 N/mm), and friction coefficients (0.166 vs 0.155, p=0.16). On histology, mild endothelial loss (<25% of surface) compared with the control was noted in arteries after 3 months of thrombectomy procedures, otherwise the arterial wall maintained the structural integrity.

Contrast angiographies showed no micro or macro-vascular obstruction. Proximal and distal occlusions created within the middle cerebral arteries (MCAs), were consistently obtained and successfully recanalized. Additionally, interventionalists scored the model highly realistic, indicating great similarity to patients’ vasculature. The Interventionalist feedback of the model were 4.75±0.43 for the anatomy by DSA and roadmap angiography and 4.7±0.45 for all other aspects.

Conclusions The human ‘live cadaveric’ neurovascular model accurately replicates the anatomy, mechanics and hemodynamics of cerebral vasculature and allows the performance of neurointerventional procedures equivalently to patients.


Abstract E-098 Figure 1
califications were then further imaged with Micro CT for characterization of calcified structures.

**Results**

120 human cadaveric carotid artery specimens and 60 carotid endarterectomy specimens were imaged. Of these, 23 specimens were shortlisted for recurrent distinguishable patterns of calcifications with SFE and imaged with Micro CT. The patterns of calcifications were divided into three major categories namely juxta-luminal, intra-luminal and mixed. Juxta-luminal calcifications were further divided into either covered, if covered by intima or exposed if not covered by non-calcified intima. Intra luminal calcifications were further divided into nodules (smooth protrusion) and coral calcifications (numerous disorganized spicule and loosely consolidated small fragments of calcified particles). Coral calcifications could be either immobile (covered with tissue) or mobile (loosely attached to the arterial surface by thin threads of tissue).

**Conclusion**

Laser angioscopy revealed recurrent phenotypes of intimal calcification with possible diagnostic, prognostic, and therapeutic relevance.

**Disclosures**


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**E-100**

**NEW OR DEVELOPING INTRACRANIAL HEMORRHAGE AFTER MECHANICAL THROMBECTOMY**

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**Introduction**

Mechanical thrombectomy (MT) serves as an alternative measure to medically refractory cases of cerebral venous thrombosis (CVT). Here we describe new or increased intracerebral hemorrhage (ICH) as a periprocedural complication to MT for CVT and its correlative factors.

**Methods**

A retrospective review of all CVT cases treated with venous thrombectomy between June 2016 and August 2021 was performed within our institutional, neuroendovascular database.

**Results**

Peri-procedural new or increased ICH was identified in 8/30 (26.7%) of patients overall. In all of these patients, new or increased ICH was identified post-MT. Presence of stupor or coma was identified in 10/30 (33.3%) of patients. Among these, 5/10 (50%) experienced new or increased ICH. Partial recanalization after MT occurred in 13/30 (43.3%) of patients. Among these, 6/13 (46.1%) experienced new or increased ICH. Among the 17 who did not achieve partial recanalization (13 with complete and 4 with none), 15/17 (88.2%) did not experience new or increased ICH ($p<0.01$). Internal juxtal (IJ) sinus occlusion was identified in 9/30 (30%) of our CVT cohort. A strong negative correlation was identified between IJ thrombosis and development of new or increased ICH (0/9, $p<0.01$).

**Conclusion**

Peri-procedural new or increased ICH showed a strong positive correlation with presence of stupor/coma, partial recanalization, and a negative correlation with IJ thrombosis. The association with partial recanalization will be incorporated in future studies with a larger cohort to determine if incomplete MT may be predictive of other outcomes as well.

**Disclosures**


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**E-101**

**RESCUE STENTING FOR INTRACRANIAL STENOSIS IN EMERGENT LARGE VESSEL OCCLUSION PATIENTS USING THE NEUROFORM ATLAS STENT THROUGH THE GATEWAY BALLOON: PRELIMINARY REPORT**

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**Introduction**

Management of acute large vessel occlusion due to intracranial stenosis remains challenging with high complications and poor recanalization rates. Morbidity is also related to the intracranial exchange that is required for stent placement after the rescue angioplasty. We aim to present our initial experience of deployment of Neuroform Atlas stent through the lumen of a Gateway angioplasty balloon to avoid microcatheter exchange.

**Methods**

Patients were identified from prospectively collected mechanical thrombectomy stroke database from Feb 2019 to July 2021. Demographic and clinical information was collected. Primary outcomes were favorable functional outcome at hospital discharge (modified Rankin Scale (mRS) score of 0–3), and the rate of intracranial hemorrhage (ICH). Good angiographic recanalization (TICI ≥ 2b), and mortality at 30 days were other outcomes.

**Results**

We identified 5 patients treated with this approach [mean age 54 ± 14 years, all were men] who presented with large vessel occlusion of middle cerebral artery. Initial median NIHSS was 8 (range 6–16) with one patient received IV t-PA. Patient initially underwent mechanical thrombectomy using the Solumbra technique. Due to reclosure or impending occlusion with evidence of atherosclerotic plaque, rescue angioplasty with stent placement was performed. Patients were loaded with 650 mg of aspirin and 180 mg of ticagrelor through nasogastric tube prior. Balloon angioplasty was performed using the gateway balloon size ranging from 1.5 to 3 mm which was inflated to subnominal pressures over 1 minutes. This was followed by placing Neuroform atlas stent through the gateway balloon with size ranging from 3 to 4 mm diameter and length 21–24 mm. TICI ≥ 2b was achieved in 4 patients. Mean time from symptoms onset to revascularization was (336 ± 90) minutes. One patient had asymptomatic ICH. 2 patients had mRs 0–3 at the time of discharge and one patient was dead at 1 month.

**Conclusion**

Our preliminary experience showed diminished risk of guidewire perforation as well as potentially decreased operative time and early reperfusion by deploying the Neuroform stent through a compatible gateway balloon microcatheter. This should be investigated further in large multicenter studies.

**Disclosures**