Abstract P-014 Table 1 Malfunctions by catheter and outcome. Abstract table limit requires category 'Other'

Catheter	Death	Injury	No Adverse Event	Total
3 MAX	1	45	322	368
5 MAX	0	9	374	383
ACE 60	0	1	57	58
ACE 64	0	12	75	87
ACE 68	0	4	247	251
Jet 7	13	19	258	290
Penumbra 032	0	1	139	140
Penumbra 054	0	2	55	57
Other	0	5	200	174

occurred on the back table during device preparation. Detailed descriptions of unique malfunction mechanisms for each catheter are omitted from this brief abstract but are available for presentation.

Conclusion Reperfusion catheter failures resulting in injury or death are rare. These findings suggest that current methods of FDA surveillance have effectively identified outliers.

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P-015 THE ZOOM SYSTEM DEMONSTRATES HIGHER FIRST PASS EFFECT AND FASTER REPERFUSION AS COMPARED TO A CONSECUTIVE CONTEMPORANEOUS SERIES OF ASPIRATION CATHETERS: ANALYSIS FROM A MULTICENTER RETROSPECTIVE COHORT

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Background Modern aspiration catheters have revolutionized thrombectomy outcomes. The Zoom System is series of catheters, with ID's of 0.045, 0.055, 0.071, and 0.088, that are advertised as being designed to support superior stroke thrombectomy performance. We aimed to preliminarily evaluate such claims by retrospectively assessing technical outcomes in a consecutive series of M1 ELVOs in which aspiration was the first line approach.

Methods We performed a retrospective multicenter analysis of consecutive ELVO patients with M1 occlusion treated within 24 hours from the time of last known well. Patients were divided into two cohorts: those in whom the Zoom 088 or 071 was the initial technology used to attempt reperfusion and those in whom any other aspiration catheter was used for initial reperfusion attempt. The primary outcome was excellent reperfusion (TICI $\geq$ 2C) on first pass. Secondary outcomes included the rate of excellent reperfusion and successful reperfusion (TICI $\geq$ 2B), access to successful reperfusion time, and occurrence of downstream emboli. All data was self-adjudicated. No outside funding was provided for this analysis.

Results Total of 660 patients with acute M1 occlusion who underwent thrombectomy were identified. Zoom System catheters (088 or 071) were used as primary aspiration catheter in 172 patients, while 488 patients were treated with other aspiration catheters (ranging from 064 to 074). The baseline mRS score, admission NIHSS score, the rate of intravenous thrombolytic therapy, symptom onset to hospital arrival, and use of anesthesia were not different between the cohorts. The primary outcome, first pass excellent reperfusion, was significantly higher in the Zoom System cohort (51% vs 41%, $p=0.02$). The rate of excellent reperfusion was significantly higher in the Zoom cohort (68% vs 59%, $p=0.04$), however, there was no difference in the rate of successful reperfusion (96% vs 94%, $p=0.78$). Access time to final reperfusion was significantly faster in the Zoom cohort (27 vs 35 minutes, $p<.0001$). After adjusting for confounding factors (age, thrombectomy technique, use of secondary aspiration catheter), access time to TICI 2B (30 vs 35 minutes, $p=0.028$) and final recanalization (25 vs 31 minutes, $p=0.018$) were significantly shorter in the Zoom System cohort.

Conclusion This retrospective, multicenter, consecutive real-world experience suggests that using Zoom 088 or 071 as primary aspiration catheter may demonstrate superior technical outcomes for M1 thrombectomy.

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P-016 ASSOCIATION OF CEREBRAL MICROBLEEDS AND CLINICAL OUTCOMES FOLLOWING ENDOVASCULAR STROKE THERAPY

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Introduction/Purpose Cerebral microbleeds (CMBs) are associated with the risk of hemorrhagic and ischemic stroke. We investigated the association between presence of CMBs and clinical outcomes following endovascular therapy (EVT) for emergent large vessel occlusion (ELVO) stroke.

Materials and Methods This is a retrospective analysis of consecutive adult patients undergoing EVT for an ELVO with available pre-interventional MR imaging between 2013-2019. Pretreatment GRE MRI sequences were analyzed in all patients to explore the frequency and location of prior microbleeds. Primary outcomes included post-interventional intracerebral hemorrhage (ICH) and favorable outcome defined as functional independence with modified Rankin Scale scores of

0 to 2 at discharge. Association of outcomes with prior CMBs was quantified using multiple logistic regression.

Results Among 155 patients included in the analysis (mean age 67.5, SD 1.15; 56.2% female), 20 (12.9%) had CMBs on GRE imaging prior to EVT. Among those with CMBs, 8 (40%) patients had strictly lobar, 4 (20%) had mixed cortical/subcortical, and 5 (25%) patients had high burden (>5) microbleeds. Older age, female sex, and presence of atrial fibrillation were significantly higher in patients with CMBs. Overall, 41 (26.4%) developed ICH, among whom 9 (5.8%) were symptomatic. In multivariable analysis adjusting for age, sex, presenting NIHSS, hypertension, diabetes mellitus, atrial fibrillation, intravenous tPA, and successful recanalization, there was no statistically significant association between the presence of CMB and ICH (OR 1.19, 95% CI 0.25-4.90, $p=0.83$) or favorable clinical outcome at discharge (OR 1.25, 95% CI 0.38-4.01, $p=0.71$). Results remained unchanged in subgroup analyses based on CMB location or burden.

Conclusion Our analysis indicates that the presence of CMBs is not significantly associated with poor clinical outcome or the risk of ICH following EVT.

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P-017

EVALUATION OF RADIOFREQUENCY-INDUCED HEATING IN AN X-RAY AND MR-VISIBLE INTERVENTIONAL CATHETER AT 3.0 T

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Introduction Successful mechanical thrombectomy in the case of acute ischemic stroke can be inferred from the angiogram, and MRI information can provide insight regarding extent of cerebral infarct and whether further reperfusion therapy may increase the risk of hemorrhage. Recently, it has been shown that intra-procedural MRI can influence critical decision making to pursue further endovascular therapy. These decisions have been enabled by combined X-ray angiography MRI suites; all the while compatible tooling has lagged. Here, we have performed initial safety tests in vitro to validate the safety of a polymer-based guide catheter with in-wall X-ray and MR-visible markers.

Methods A guide catheter prototype was built using polymer-based filament in a catheter fabrication facility (Penumbra, Inc., Alameda, CA). Four circumferential marker bands were painted 2 cm from the distal tip. Markers were an epoxy-based radiopaque ink (Creative Materials, Ayer, MA) doped with iron(III) oxide (Fe₂O₃) nanoparticles of 20-40 nm diameter (Alfa Aesar, Tewksbury, MA). The device was then laminated with a multi-durometer thermoplastic jacket. Experiments were performed in a clinical biplane x-ray neuroangiography and 3.0 T MRI suite (Magnetom Skyra, Siemens Healthineers, AG, Forchheim, Germany).

The catheter was embedded into an acrylic phantom, per ASTM F2182-19e2. The head portion was made of a

polyacrylamide gel and the body was filled with saline. The catheter extended 25 cm into the head and was laterally positioned 17 cm from the midline of the body and 6 cm from the midline of the head. Radiofrequency-induced heating of the prototype was assessed for worst-case heating as a function of insertion length. Heating directly adjacent to the catheter was measured using fluoroptic temperature probes (FOT Lab Kit with STF probes; LumaSense, Santa Clara, California). Two probes were embedded at the distal tip of the catheter and 10 cm proximal to the tip. Temperature was continuously measured over the course of 6 minutes: 2 minutes of baseline prior to imaging, 2 minutes of imaging using a True FISP sequence with a SAR of 4 W/kg, and 2 minutes of equilibration after imaging. The immersed length started at 95 cm and was shortened by 5 cm after each 6-minute test until the immersed length was 60 cm.

Results Maximum temperature and change in temperature were recorded. The largest temperature change occurred at 95cm, where the temperature rose by 0.45 °C and 0.70 °C at the device tip and 10 cm proximal to the tip, respectively. Over the entire testing period, the local temperature around the device tip and 10 cm proximal to the tip rose 1.48°C and 1.68°C, respectively.

Conclusions Initial immersion tests suggest that the worst-case scenario for RF-induced heating of our guide catheter prototype occurs at 95 cm. During the period of our tests, our prototype remained safely under the maximum permitted temperature rise of +2°C/hr of exposure. This study suggests that our guide catheter may be retained during an intra-procedural MRI without the safety risk of RF-induced device heating over time to the patient.

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P-018

VESSEL WALL IMAGING WITH MRI TO ASSESS ENDOTHELIAL WALL INJURY POST MECHANICAL THROMBECTOMY

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Purpose Mechanical thrombectomy using stent retrievers, aspiration catheters, or a combination of both are commonly used in practice to treat large vessel occlusion. Recent MR Vessel Wall Imaging (VWI) studies in patients status post thrombectomy in the acute and subacute phases have shown persistent increased vessel wall enhancement when compared to controls, which is likely representative of the endothelial damage to the vessel wall as shown on earlier histopathologic studies. In this study of 10 patients who underwent thrombectomy at our institution, we preliminarily explore the type and amount of vessel wall enhancement associated with different methods of thrombectomy and number of passes.

Materials and Methods 10 adult patients from 5/7/2019 to 9/9/2020 with occlusion of M1 segment who were admitted following mechanical thrombectomy underwent a 3T brain MRI within 48 hours post-thrombectomy which included a 3D T1 black blood sequence before and after intravenous