Code terminology and number of prescribed days during the 6-months following CAS.

Results In total, 79,084 patients diagnosed with either ischemic stroke or carotid stenosis received either CEA (71,178; 90.0%) or CAS (7,906; 10.0%). After adjusting for available covariates, fewer than 180 days of prescribed post-CAS P2Y12 inhibition was associated with increased risk for stroke (<90 prescribed days HR=1.421, 95% CI 1.038–1.946; 90–179 prescribed days HR=1.484, 95% CI 1.045–2.106). The incidence of hemorrhagic complications was higher during the period of prescribed P2Y12 inhibition (1.16%/person-month vs 0.49%/person-month after discontinuation, p<0.001). The rate of extracranial hemorrhage was nearly 6-fold higher while on dAPT (6.50%/patient-month vs 1.16%/patient-month, $p<0.001$), and there was a trend towards higher rate of intracranial hemorrhage that did not reach statistical significance (5.09%/patient-month vs 3.69%/patient-month, $p=0.0556$). Later hemorrhagic events beyond 30 days post-CAS were significantly more likely to be extracranial than intracranial ($p=0.028$).

Discussion Increased duration of post-CAS dAPT is associated with lower rates of readmissions for stroke, and with increased risk of hemorrhagic complications, particularly extracranial hemorrhage. The potential benefit of prolonging dAPT with regard to ischemic complications must be balanced with the corresponding increased risk of predominantly extracranial hemorrhagic complications. Further studies are warranted to determine the optimal post-CAS antiplatelet regimen and duration.

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O-023 VOLUMETRIC AND SPATIAL ASSESSMENT OF CEREBRAL INFARCT AND PENUMBRA TISSUE FOR MULTIPLE COMPUTED TOMOGRAPHY PERFUSION SOFTWARE IN ACUTE ISCHEMIC STROKE PATIENTS

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Introduction/Purpose Utilization of computed tomography perfusion (CTP) to quantify infarct core and penumbra is commonly conducted to determine acute ischemic stroke patient (AIS) eligibility for endovascular intervention procedures. Accurate estimations of infarct and penumbra spatial location are essential as they provide information regarding the location of the vessel occlusion and regions where infarct will advance to. Discrepancies have been known to occur between various CTP software regarding volumetric calculations and spatial location of ischemic tissue due to different perfusion parameters and thresholds being used across software. This study aimed to assess the spatial and volumetric accuracy of RAPID, Sphere, and Vitrea CTP software predicted infarct and penumbra in comparison with final infarct from fluid-attenuation inversion recovery (FLAIR) magnetic resonance imaging (MRI).

Materials and Methods Sixty emergent large vessel occlusion AIS patients treated at a single comprehensive stroke center were included in this study. All patients were required to have undergone initial CTP imaging and 24-hour follow-up FLAIR MRI. Thirty endovascular intervention and 30 medical management patients were included to assess infarct and penumbra tissue, respectively. Endovascular intervention patients were required to have achieved complete successful reperfusion defined as thrombolysis in cerebral infarction 2c/3 to assure all penumbra was salvaged. For medical management patients, it is assumed that all estimated penumbra has converted to infarct on follow-up FLAIR MRI. Within RAPID, Sphere, and Vitrea CTP software, infarct and penumbra tissue was quantified and segmented. Volumetric assessment of CTP infarct and penumbra volumes were conducted using mean infarct differences and mean absolute error (MAE). Spatial accuracy of segmented ischemic tissue was assessed using Dice coefficients, overlap coefficients, sensitivity, specificity, and accuracy metrics.

Results Mean infarct differences, represented as 95% confidence intervals, between FLAIR MRI and each CTP software for each patient cohort are: Intervention patients- RAPID=4.9 ±6.4 mL, Sphere=-4.5±6.6 mL, Vitrea=3.5±4.9 mL; Medical management patients- RAPID=-40.0±23.3 mL, Sphere=-21.4 ±17.4 mL, Vitrea=7.4±10.3 mL. MAEs for predicted infarct from each software compared to FLAIR MRI infarct are: Intervention patients- RAPID=13.7 mL, Sphere=12.8 mL, Vitrea=7.3 mL; Medical management patients: RAPID=52.5 mL, Sphere=34.3 mL, Vitrea=18.9 mL. Spatial assessment metrics for ischemic tissue for each patient group and for each software are indicated in table 1.

Conclusions Volumetric results indicate RAPID, Sphere, and Vitrea CTP software all perform similarly in assessing volumetric agreement with final FLAIR MRI infarct for endovascular intervention patients. However, spatial agreement metrics indicate Vitrea performs the best in locating infarct for endovascular intervention patients. For medical management patients, Vitrea software appears the most accurate in assessing penumbra based on volumetric measurements in addition to overlap coefficients.

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Abstract O-023 Table 1 Degree of spatial accuracy for quantified infarct between each FLAIR MRI and each CTP software

Intervention Patients					
	Dice Coefficient	Overlap Coefficient	Sensitivity	Specificity	Accuracy
RAPD	0.49±0.13	0.55±0.14	0.50±0.12	0.99±0.01	0.98±0.01
Sphere	0.58±0.04	0.68±0.03	0.57±0.04	0.99±0.01	0.97±0.01
Vitrea	0.63±0.03	0.72±0.02	0.62±0.03	0.99±0.01	0.98±0.01
Medical Management Patients					
	Overlap Coefficient	Overlap Coefficient	Sensitivity	Specificity	Accuracy
RAPID	0.53±0.05	0.70±0.05	0.54±0.05	0.99±0.01	0.97±0.01
Sphere	0.59±0.03	0.74±0.03	0.60±0.03	0.98±0.03	0.98±0.01
Vitrea	0.67±0.03	0.74±0.03	0.66±0.04	0.99±0.01	0.98±0.01

University–DSMB Chair for HEAT Trial, Penumbra, Q'Apel Medical Inc, Rapid Medical, Rebound Therapeutics Corp, Serenity Medical Inc, Silk Road Medical, StimMed, Stryker, Three Rivers Medical, Inc, VasSol, W.L. Gore & Associates. 4; C; Amnis Therapeutics, Apama Medical, Blink TBI Inc., Buffalo Technology Partner Inc., Cardinal Consultants, Cerebrochtech Medical Systems Inc., Cognition Medical, Endostream Medical Ltd, Imperative Care, International Medical Distribution Partners, Neurovascular Diagnostics Inc., Q'Apel Medical Inc, Rebound Therapeutics Corp, Rist Neurovascular Inc, Serenity Medical Inc, Silk Road Medical, StimMed, Synchron, Three Rivers Medical Inc., Viseon Spine Inc. **E. Levy:** 2; C; Claret Medical, GLG Consulting, Guidepoint Global, Imperative Care, Medtronic, Rebound, StimMed. 4; C; NeXtGen Biologics, RAPID Medical, Claret Medical, Cognition Medical, Imperative Care (formerly the Stroke Project), Rebound Therapeutics, StimMed, Three Rivers Medical. **Y. Hoi:** 5; C; Canon Medical Systems Inc. **C. Ionita:** 1; C; Equipment grant from Canon Medical Systems, Cummings Foundation support. **K. Snyder:** 2; C; Canon Medical Systems Corporation, Penumbra Inc, Medtronic, Jacobs Institute.

O-024 FOUR OR MORE THROMBECTOMY PASSES, TPA USE, AND HIGH INITIAL STRESS GLUCOSE RATIO ARE INDEPENDENTLY ASSOCIATED WITH MALIGNANT CEREBRAL EDEMA AFTER MECHANICAL THROMBECTOMY: A SINGLE-CENTER, RETROSPECTIVE STUDY

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Background The development of malignant cerebral edema (MCE) after large-vessel occlusion mechanical thrombectomy (MT) with the ensuing requirement for decompressive craniectomy is a dreaded outcome of stroke. We analyzed factors associated with the development of malignant cerebral edema following mechanical thrombectomy.

Methods We performed a retrospective analysis of anterior cerebral circulation large vessel occlusion cases that underwent MT from April 2012 to November 2019 at single comprehensive stroke center. Data included patient demographics, presenting NIHSS score, vessel occlusion site, onset-to-revascularization timing, presenting blood glucose, 90 day modified Rankin Scale (mRS), post-procedural intracerebral hemorrhage (PH1 or PH2), and post-procedural development of MCE (midline shift greater than 5 mm associated with neurological deterioration after greater than 50% infarction of the MCA territory). Multi-variate logistic regression analyses were performed to determine significant predictors of malignant cerebral edema and poor functional outcome (mRS 3–6) at 90 days.

Results 400 patients were included in the analysis. 42 (10.5%) patients developed MCE following mechanical thrombectomy with 26 (6.5%) patients undergoing decompressive craniectomy. Significant independent predictors of MCE following MT included: NIHSS (OR 1.10, 95% CI: 1.03–1.18; p=0.008), tPA administration (OR 2.38 95% CI: 1.04–5.46; p=0.041), 4 or more thrombectomy passes (OR 5.25, 95% CI: 1.53–17.94; p=0.008), and initial stress glucose ratio (OR 14.92 95% CI: 3.95–56.43; p<0.001). Significant predictors associated with decreased risk of MCE included: M1 occlusion compared to ICA occlusion (OR 0.40 95% CI: 0.18–0.88; p=0.022) and TICI 2C/3 recanalization (OR 0.27, 95% CI: 0.09–0.78; p=0.015). Significant predictors of a poor functional outcome included: age (OR 1.05, 95% CI: 1.03–1.07; p<0.001), NIHSS (OR 1.10, 95% CI: 1.05–1.15; p<0.001), initial stress glucose ratio (OR 4.49, 95% CI: 1.60–12.61; p=0.004), intracerebral hemorrhage (PH1 or PH2) (OR 4.74, 95% CI: 1.20–18.69; p=0.026) and MCE (OR 6.56, 95% CI: 2.00–21.59); p=0.002). The sole significant predictor against a poor functional outcome at 90 days was TICI 2C/3 recanalization (OR 0.17, 95% CI: 0.07–0.38; p<0.001).

Conclusion Our data demonstrate an association of malignant cerebral edema with ICA occlusion, higher presenting NIHSS scores, tPA administration, 4 or more thrombectomy passes, and a high initial stress glucose ratio. Malignant cerebral edema is associated with poor functional outcome at 90 days. Further investigation of causes of malignant cerebral edema after MT are warranted.

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O-025 OUTCOMES OF RESCUE ENDOVASCULAR TREATMENT OF ACUTE ISCHEMIC STROKE IN PATIENTS WITH UNDERLYING INTRACRANIAL ATHEROSCLEROSIS – INSIGHTS FROM STAR REGISTRY

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Introduction Mechanical Thrombectomy (MT) is the standard of care for patients presenting with emergent large vessel occlusion (ELVO) with salvageable tissue. A subgroup of ELVO is refractory to reperfusion due to underlying intracranial atherosclerosis (ICAS), often requiring rescue therapy with balloon angioplasty, stenting or both. Whether such rescue therapy is safe and effective remains to be established. The purpose of this study is to investigate the safety, efficacy, and long-term outcomes of MT for ELVO related ICAS.

Methods We queried the databases of 11 thrombectomy-capable centers in the US and Europe included in STAR (**S**troke **T**hrombectomy and **A**neurysm **R**egistry). In this analysis, we included patients who underwent rescue therapy (balloon angioplasty and/or stenting) in the setting of ELVO due to underlying ICAS. A matched sample was produced by matching on the variables of age, admission NIHSS, and location of the occlusion.

Results Out of 2827 thrombectomy patients included in STAR at the time of this analysis, 190 patients required rescue therapy for ELVO with underlying ICAS. Balloon angioplasty was performed on 116 patients, and 113 patients had intracranial stenting. On multivariate analysis, after controlling for age, sex, race, hypertension, diabetes, prior stroke, NIHSS on