clot length is correlated with a greater number of passes and longer time to revascularization.

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O-007 RECANALIZATION AND OUTCOME COMPARISONS IN ACUTE ISCHEMIC STROKE PATIENTS TREATED WITH MECHANICAL THROMBECTOMY SELECTED BY CT/MR PERFUSION IMAGING VERSUS CT ANGIOGRAPHY

[1]A Honarmand, [2]A Shaibani, [2]M Hurley, [1]P Golnari, [2]M Potts, [2]B Jahromi, [2]S Ansari. *[1]Radiology, Northwestern University Feinberg School of Medicine, Chicago, IL; [2]Radiology and Neurological Surgery, Northwestern University Feinberg School of Medicine, Chicago, IL*

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Purpose Several randomized controlled trials, have demonstrated improved percentages of independent clinical outcomes with computed tomography (CT)/magnetic resonance (MR) perfusion selection in acute ischemic stroke (AIS), albeit with more stringent patient exclusion. Conversely, preprocedure CT angiography (CTA) is gaining increasing credence among neurointerventionalists for documenting emergent large vessel occlusion and as a surrogate for tissue selection via collateral imaging. In this study, we compared the level and times to recanalization as well as clinical outcomes in patients selected for endovascular thrombectomy based on their perfusion versus single phase CTA imaging selection.

Materials and methods We performed a prospective IRB approved multicenter study of consecutive AIS patients presenting <6 hours from symptom onset that underwent mechanical thrombectomy. Patients were selected after CTA/MRA confirmed ICA/MCA M1-M2 occlusion and either CTP/MRP (favorable mismatch ratio/core infarct volumes) or CT/CTA (ASPECTS >6 and pial collaterals >2/3 MCA) imaging selection. Patient demographics, baseline NIHSS score, THRIVE score, symptom onset to groin puncture times, and the type of thrombectomy devices utilized for recanalization were studied. Modified Rankin Scale score of 0–2 at 90 days defined good functional outcome. Recanalization was delineated by the neurointerventionalist at the end of the thrombectomy according to modified TICI classification. Ordinal recanalization scores of 0, 1, 2, 3, and 4 were assigned to TICI classification of 0, 1, 2a, 2b, and 3, respectively for further evaluation of recanalization reperfusion level. TICI scores of 2 b and 3 defined successful recanalization Chi-square, student t test, Mann-Whitney U, and Kruskal-Wallis tests were utilized for statistical analysis as appropriate.

Results Seventy patients (37 F/33 M, mean age±SD of 64.43 ± 15.08 years) were recruited into the study. Based on preprocedure imaging, consecutive patients were selected for endovascular thrombectomy either by CTA (n = 35) or perfusion studies (n = 35). Both groups were comparable in terms of demographics, NIHSS score, THRIVE score, and thrombectomy devices utilized for recanalization. Symptom onset to groin puncture time was significantly lower in the CTA group (mean = 138.50 min in CTA VS. 224.25 min in perfusion groups, P = 0.012). Recanalization scores were not significantly associated with the type of thrombectomy devices (P = 0.782). Although recanalization scores were significantly higher in patients selected by CTA compared with perfusion imaging (P = 0.020), successful recanalization (TICI 2 b/3) was not significantly different (P = 0.155). There was a non-statistically significant trend for good functional outcome in CTA group (P = 0.07). Good functional outcome was associated significantly with successful recanalization (P < 0.005).

Conclusions Mechanical thrombectomy patients selected by CTA or perfusion imaging demonstrated no difference in successful recanalization rate, but higher level of recanalization/reperfusion and a trend of improved outcomes with CTA selection that may be attributed to improved treatment times.

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O-008 FUNCTIONAL AS OPPOSED TO ANATOMICAL CHARACTERIZATION OF THE MIDDLE CEREBRAL ARTERY "M2" DIVISIONS CAN EXPAND THE CATEGORY OF LARGE VESSEL OCCLUSIONS AMENABLE FOR STROKE INTERVENTIONS.

[1]A Rai, [1]A Tarabishy, [2]P Link, [1]S Boo, [1]N Lucke-Wold, [1]J Domico, [1]J Carpenter. *[1]Interventional Neuroradiology, West Virginia University, Morgantown, WV; [2]Stryker Neurovascular, Fremont, CA*

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Background M2 occlusions have typically been excluded from endovascular stroke trials. However variations in the size of the MCA branches and the area of brain they supply runs the risk of excluding a dominant trunk supplying a large part of the brain and hence resulting in a significant ischemic injury. Perfusion imaging allows a more functional depiction of the vascular territory and maybe more relevant for endovascular selection.

Objective To determine the rate of M2 occlusions amongst all hospital discharges for acute ischemic stroke (AIS) and to functionally classify occlusion severity based on baseline perfusion imaging and final infarct volume. To secondarily extrapolate this rate to the national inpatient sample (NIS) database for estimating the annual burden of M2 occlusions that may benefit from endovascular therapy.

Methodology All hospital discharges for AIS (ICD-9 codes 433.xx, 434.xx 435.xx) over a 3 year period from a large rural hospital system were screened for an M2 occlusion based on admission imaging. These were classified into the superior or inferior trunk based on anatomy and dominant or non-dominant division based on size. The occlusion severity was graded on time-to-peak (TTP) perfusion imaging as a proportion of the entire MCA. Infarct volume on follow up imaging represented the final ischemic injury. The results were extrapolated to the NIS-database.

Results Out of 2757 AIS hospital discharges 118 (4.3%) patients were identified with an M2 occlusion. 71 (60.2%) of these patients presented within 6 hours and 47 (39.8%) after 6 hours of last seen normal (LSN). Baseline perfusion (TTP) and follow-up imaging was available for 75 patients. The superior trunk (ST) was involved in 36 (48%) and the inferior trunk (IT) in 39 (52%) patients. In 27 (75%) patients with ST involvement, it was the dominant division versus 36 (92.3%) patients with IT occlusion had it as the dominant division (p = 0.037). Overall a dominant division was occluded in 63 (84%) patients and a non-dominant in 12 (16%) patients. In 47 (74.6%) patients with a dominant branch occlusion (ST or IT) the TTP abnormality was >1/3rd of the MCA distribution versus 5 (41.7%) patients with a non-dominant branch occlusion that had >1/3rd MCA involvement (p = 0.02). Patients with a dominant branch occlusion

had a final infarct volume of 49.6 cm^2 (±46.3) versus a volume of 16.7 cm^2 (±13.8) for non-dominant occlusions (p = 0.009). In patients with >1/3rd MCA involvement on TTP images the infarct volume was 51.5 cm^2 (±47.6) versus an infarct volume of 28.1 cm^2 (±31.5) in patients with ≤1/3rd MCA abnormality (p = 0.03). There were 1,135,030 AIS discharges nationally for 2013 for the same ICD-9 codes. A 4% rate of M2 occlusions yields 45,401 potential patients with an M2 occlusion of which 38,137 can have a dominant branch involvement and hence the risk of significant ischemic injury.

Conclusion Patients with a dominant branch occlusion, whether superior or inferior, had larger TTP abnormalities (>1/3rd MCA) and final infarct volumes. An estimated 37,137 AIS patients can have a dominant M2 occlusion with significant risk of ischemic injury. A functional as opposed to pure anatomical classification may allow selecting these patients for endovascular therapy.

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O-009 ASPECTS SCORES AND DWI VOLUME: HOW WELL DO THEY CORRELATE?

[1]F Hui, [2]J Bullen, [3]S John, [3]G Toth, [3]S Hussain. *[1]Radiology, Johns Hopkins, Baltimore, MD; [2]Quantitative Health Services, Cleveland Clinic, Cleveland, OH; [3]Neurological Institute, Cleveland Clinic, Cleveland, OH*

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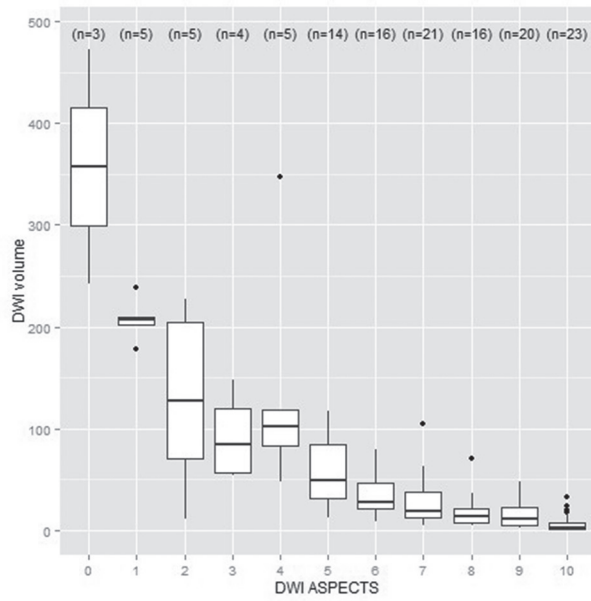
Recent trials for the management of large vessel occlusion for acute ischemic stroke have demonstrated better outcomes for intervention over IV tPA alone. Ideal imaging triage remains uncertain, however CT only paradigms, volumetric paradigms, penumbral paradigms and collateral paradigms have been proposed and used. The volumetric exclusion criteria employed in EXTEND-IA and SWIFT-PRIME may have contributed to mRS 0–2 rates of 71% and 60% respectively. One of the appeals of MR estimation of irreversible "core" infarct is that it is the most accurate readily available modality. CT ASPECTS is more widely available, but may underestimate the volume of core.

Statistical methods The Pearson correlation coefficient was used to assess the amount of linear correlation between ASPECTS and DWI volume. The DWI volume values observed within each ASPECT score were then summarized. An empirical receiver operating characteristic (ROC) curve was used to summarize the accuracy of using ASPECTS to predict DWI volume less than 70 cc. The operating point furthest from the chance diagonal was selected as the optimal ASPECTS threshold and 95% Agresti-Coull confidence intervals were calculated for the sensitivity and specificity at this cut point.

Results DWI ASPECTS and DWI volume had a strong negative correlation (r = –0.76; 95% CI: –0.67, –0.82), though there was a fair amount of variability in DWI volume within a given DWI ASPECT score. CT ASPECTS and DWI volume had a moderate negative correlation (r = –0.50; 95% CI: –0.36, –0.62), though there was considerable variability in DWI volume for a given CT ASPECT score. In this sample, there were 105 patients with DWI volume < 70 cc and 27 with volume ≥ 70 cc. The area under the ROC curve for predicting DWI volume < 70 cc was 0.93 for DWI ASPECTS and 0.81 for CT ASPECTS. The ASPECTS thresholds which maximized the overall rate of correct classification were 5 and 8 for DWI and CT, respectively. When DWI ASPECTS > 5 was considered positive for DWI volume < 70, the estimated sensitivity and specificity were 0.88 (92/105; 95% CI: 0.80, 0.93) and 0.85 (23/27; 95% CI: 0.67, 0.95), respectively. When CT ASPECTS > 8 was considered positive for DWI volume < 70, the estimated sensitivity and specificity were 0.64 (67/105; 95% CI: 0.54, 0.72) and 0.85 (23/27; 95% CI: 0.67, 0.95), respectively.



Abstract O-009 Figure 1

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O-010 PLANNING FOR EFFICIENCY: SURVEY OF TECHNICAL AND WORKFLOW PRACTICES BEFORE MECHANICAL THROMBECTOMY

[2]A Kansagra, [1]G Meyers, [2]M Kruzich, [1]D Cross, [1]C Moran, [3]C Derdeyn. *[1]Washington University School of Medicine, Saint Louis, MO; [2]Barnes-Jewish Hospital, Saint Louis, MO; [3]University of Iowa Hospitals and Clinics, Iowa City, IA*

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Background Mechanical thrombectomy plays a critical role in the management of acute ischemic stroke due to emergent large vessel occlusion (ELVO). As healthcare systems adapt to more efficiently deliver patients with ELVO for timely thrombectomy, hospitals may benefit from increased awareness of successful workflows in place at other centers experienced with endovascular intervention.

Methods E-mail and phone interviews were conducted with endovascular team members at each of 30 high volume stroke centers. Each of these centers was certified as an Advanced Comprehensive or Advanced Primary Stroke Center. Questions were categorized into four major workflow steps of triage, team activation, transport, and case preparation.

Results During the triage workflow step, 53% of surveyed institutions designate specific non-physician staff to respond to