O-017 VIZ LVO VERSUS RAPID LVO IN DETECTION OF LARGE VESSEL OCCLUSION ON COMPUTED TOMOGRAPHY ANGIOGRAPHY FOR ACUTE STROKE

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Introduction/Purpose Endovascular thrombectomy has been shown to decrease disability, improve functional outcomes, and reduce mortality over standard medical management for anterior Large Vessel Occlusion (LVO) within a time-sensitive window. The window for thrombectomy is limited, and LVOs can produce large infarcts if timely intervention is not performed to salvage ischemic brain tissue. Given the time-sensitive nature of these interventions, computer automation may aid in the early detection of these LVOs, but false values may lead to alarm fatigue and ignoring these systems altogether. We compared the accuracy of two commercially available products, Viz LVO and Rapid LVO, to detect these LVOs.

Materials and Methods Data was taken retrospectively from two HCA Houston facilities from January 2022-January 2023 from multimodal computed tomography with thin-slice computed tomography angiography (CTA) for suspected LVO. Two automated LVO detection packages, Rapid LVO and Viz LVO, were run on these images, and a Diagnostic Neuroradiologist or Neurointerventional Radiologist interpreted the scans. We calculated the sensitivity, specificity, positive predictive value, and negative predictive value and performed a McNemar test to look for a difference between the algorithm's classifications. On each of these patients, we also collected demographic data, comorbidities, ejection fraction (EF), and intracranial atherosclerosis as defined by radiologist interpretation and verification by Modified Woodcock Score >1. A multinomial logistic regression was performed to determine if any of these variables predicted the incorrect classification of a CTA.

Results A total of 360 participants were included with a mean age of 65 years old with a standard deviation of +/-16.5 with 159 males and a total of 47 large vessel occlusions confirmed by diagnostic or neurointerventional radiologists. Rapid LVO had a specificity of 0.85 and a sensitivity of 0.87, with a positive predictive value (PPV) of 0.46 and a negative predictive value (NPV) of 0.97. Viz LVO had a specificity of 0.96 and a sensitivity of 0.87, with a PPV of 0.75 and a NPV of 0.98. We formed a contingency table of correct and incorrect classification and performed a McNemar test showing a statistically significant difference between classifications by the two algorithms (p=0.00000031). We took the data relating to demographics, comorbidities, atherosclerosis on imaging, and EF and performed a multinomial logistic regression on the incorrect predictions of the algorithms. On Viz LVO, low EF (p=0.00125) and Modified Woodcock Score >1 (p=0.000198) were significant predictors of incorrect classification. When using Rapid LVO, EF (p=0.0286) and Modified Woodcock Score >1 (p=0.000000975) were also significant predictors of incorrect classification.

Conclusion Viz LVO and Rapid LVO had similar NPV, but Rapid LVO produced a significantly larger number of false positive values. False positive values can be a source of alarm desensitization, leading to missed alarms or delayed responses. EF and intracranial atherosclerosis were significant predictors of incorrect predictions in both software packages. We hope this data will be used to improve future algorithms.

Disclosures A. Delora: None. **C. Hadjialiakbari:** None. **E. Percenti:** None. **A. Hassan:** 1; C; LVO SYNCHRONIZE-Viz.ai. 2; C; Viz.ai. **Y. Alderazi:** None. **J. Torres:** None. **M. Ezzeldin:** None.

O-018 UTILIZING DSC MR PERFUSION IMAGES FOR EVALUATION OF HEMORRHAGIC TRANSFORMATION AFTER MECHANICAL THROMBECTOMY WITH HEIDELBERG GRADING AND COMPARISON TO SWI, GRE, AND CT

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Introduction Hemorrhagic transformation (HT) is a frequent complication after mechanical thrombectomy (MT), causing acute neurologic deterioration and poorer long-term functional outcomes. Classically, CT-based grading systems like the Heidelberg grade have been used to assess HT severity. No prior studies have applied Heidelberg grading to the single-shot gradient-echo echo-planar images acquired for dynamic susceptibility contrast-enhanced (DSC) MR perfusion. Given that DSC MR perfusion images are routinely acquired for assessment of ischemic penumbra, evaluation of HT on unprocessed DSC images may preclude the need for additional gradient-echo (GRE) or susceptibility-weighted imaging (SWI) sequences. This study assessed the reliability and performance of DSC MR perfusion images to detect HT using the Heidelberg classification in comparison to SWI, GRE, and CT.

Methods This study retrospectively reviewed patients with LVO undergoing MT at our institution from January 2020-August 2022. Only patients who received MRI or CT after undergoing MT were included. Two independent observers were then blinded to clinical information and asked to evaluate degree of HT on post-MT DSC MR perfusion and SWI or GRE sequences using Heidelberg. This was also done for post-MT CT, if available. Symptomatic ICH was independently assessed according to joint commission guidelines of hemorrhage on imaging and worsening NIHSS.

Results The reliability of reader ratings (Shrout-Fleiss Intraclass correlation coefficient) were similar across all DSC-MR perfusion (0.539), SWI/GRE (0.489), and CT (0.557). When pooling ratings and excluding cases with CT contrast staining, they differed between the 3 acquisitions (P<0.001). Pairwise comparisons showed the proportion with HT differed between SWI/GRE (136/213, 63.9%) and CT (111/213, 52.1%, P<0.001), SWI/GRE and DSC-MR perfusion (101/213, 47.4%, P<0.001), but not between DSC-MR perfusion and CT (P=0.332). Dichotomizing Heidelberg ratings as more likely to be clinically significant (≥grade 2) vs non-significant, proportions did not differ between SWI/GRE (93/213, 43.7%) and CT (79/213, 37.1%, P=0.093) and between CT and DSC MR perfusion (81/213, 38%, P=0.904). Grouping Heidelberg ratings into 0, 1+2, and >2, the distributions significantly differed between SWI/GRE and CT, SWI/GRE and MR perfusion, and MR perfusion and CT (P<0.001).

Conclusion Among the 3 acquisitions, HT was identified more often on SWI/GRE than on CT or MR perfusion. For HT