rehabilitation. One patient did not have angiographic cross-flow was treated with flow diverters. The patient remained dependent and succumbed one year later.

Conclusion In patients with torrential intraoperative hemorrhage during endoscopic transnasal transphenoidal surgery, endovascular treatment is frequently required and hemostasis could be secured.

Disclosures G. Wong: None.

E-155 HIGHER PREVALENCE OF INTRAPLAQUE HEMORRHAGE IN LEFT CAROTID ARTERIES THAN RIGHT

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Background Ischemic stroke is more often diagnosed in the left hemisphere than the right. One prior study has found that there may be an asymmetrical prevalence of atherosclerosis with a higher prevalence of carotid artery disease on the left than the right.

Methods We sought to study the prevalence of carotid artery atherosclerosis and intraplaque hemorrhage in the right versus left carotid artery in a large population of patients.

Results Neck MRAs of 643 total patients were reviewed. Overall, there were similar degrees and distribution of degrees of stenosis. There was a higher prevalence of intraplaque hemorrhage in the left versus right carotid for all patients (P=0.02) and for symptomatic patients (P=0.002). This was not true for asymptomatic patients. There were no differences in the prevalence of plaque ulcer between right and left carotid arteries.

Conclusions In confirming a prior report, we found that left carotids are more likely to present with intraplaque hemorrhage as compared to right carotids. This was particularly true for patients with symptomatic manifestations including stroke, transient ischemic attack, amaurosis fugax and retinal artery occlusion. The reason underlying the increased prevalence of intraplaque hemorrhage in the left carotid artery remains enigmatic.

Disclosures A. Larson: None. **J. Benson:** None. **G. Lanzino:** None. **W. Brinjikji:** None.

E-156 BRAINOMIX EASPECTS SOFTWARE IMPROVES INTEROBSERVER AGREEMENT AND ACCURACY OF NEUROLOGIST AND NEURORADIOLOGISTS IN INTERPRETATION OF ASPECTS SCORE AND OUTPERFORMS HUMAN READERS IN PREDICTION OF FINAL INFARCT

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Introduction There has been increased interest in the use of artificial intelligence based software packages in the evaluation of neuroimaging for patients with acute ischemic stroke. We performed an inter-rater agreement and accuracy study to determine if the use of the Brainomix eASPECTS software improved interobserver agreement and accuracy in detecting ASPECTS regions affected in anterior circulation LVO.

Methods We included 60 consecutive patients with anterior circulation LVO who had TICI 3 revascularization within 60 minutes of their baseline CT. A total of 16 readers; 6 senior neuroradiologists, 6 junior neuroradiologists and 4 vascular neurologists participated. Readers interpreted CT scans on an independent workstation and assessed final ASPECTS score and evaluated whether each individual ASPECTS region was affected. Two months later, the readers again evaluated the CT scans, but with the assistance of eASPECTS software. We assessed interclass correlation coefficient for total ASPECTS and interobserver agreement with Fleiss' Kappa for each ASPECTS region with and without assistance of the eASPECTS software. We also assessed accuracy for the readers with and without eASPECTS software assistance. In our assessment of accuracy, ground truth was the 24 hour CT in this cohort of patients who had prompt and complete revascularization as determined by two neuroradiologists.

Results Interclass correlation coefficient for total ASPECTS without eASPECTS assistance was 0.395 indicating fair agreement compared to 0.574 with eASPECTS assistance indicating good agreement (P<0.01). There was significant improvement in inter-rater agreement with eASPECTS assistance for each individual region with the exception of the M6 and caudate. For example, kappa statistics improved from 0.60 to 0.83 for the M1, 0.38 to 0.67 for the M2, 0.35 to 0.57 for the insula

Abstract E-155 Table 1

	Overall			Symptomatic Patients			Asymptomatic Patients		
	Right	Left	P	Right	Left	P	Right	Left	P
N	643	643	-	419	419	-	224	224	-
Mean (SD) Degree of Stenosis	18.1 (29.7)	18.1 (30.7)	0.99	22.5 (31.6)	23.0 (32.9)	0.82	9.8 (23.5)	9.1 (23.7)	0.75
Plaque Ulcer N (%)	30 (4.7)	37 (5.8)	0.45	21 (5.0)	34 (8.1)	0.09	9 (4.0)	3 (1.3)	0.14
Plaque Hemorrhage N (%)	46 (7.2)	72 (12.0)	**0.02**	39 (9.3)	71 (16.9)	**0.002**	7 (3.1)	11 (4.9)	0.47
Degree of Stenosis N (%)									
<30%	469 (72.9)	475 (73.8)	0.75	278 (66.3)	279 (66.6)	0.99	191 (85.2)	196 (87.5)	0.58
30–49%	36 (5.6)	32 (5.0)	0.71	30 (7.2)	26 (6.2)	0.68	6 (2.7)	6 (2.7)	1.0
50–69%	64 (10.0)	59 (9.2)	0.71	52 (12.4)	51 (12.2)	0.99	12 (5.4)	8 (3.6)	0.49
70+%	74 (11.5)	77 (12.0)	0.86	59 (14.1)	63 (15.0)	0.77	15 (6.7)	14 (6.3)	0.99

Abstract E-156 Table 1

	No eASPECTS Assistance		Yes eASPECTS Assistance		
	% Overall Agreement	Kappa (95%CI)	% Overall Agreement	Kappa (95%CI)	Significant?
M1	79.8%	0.60 (0.50-0.69)	91.6%	0.83 (0.76-0.90)	Yes
M2	69.0%	0.38 (0.29-0.47)	83.4%	0.67 (0.58-0.75)	Yes
M3	76.0%	0.52 (0.43-0.61)	86.0%	0.72 (0.63-0.81)	Yes
M4	83.8%	0.68 (0.60-0.75)	93.8%	0.88 (0.82-0.93)	Yes
M5	72.0%	0.44 (0.36-0.52)	83.0%	0.66 (0.58-0.74)	Yes
M6	87.2%	0.74 (0.66-0.83)	91.6%	0.83 (0.76-0.91)	No
Caudate	85.5%	0.71 (0.63-0.79)	89.1%	0.78 (0.70-0.87)	No
Lentiform	71.8%	0.44 (0.33-0.54)	82.6%	0.65 (0.56-0.75)	Yes
Insula	67.7%	0.35 (0.27-0.44)	78.7%	0.57 (0.47-0.67)	Yes
Internal Capsule	81.2%	0.62 (0.53-0.72)	91.2%	0.82 (0.76-0.89)	Yes

	Accuracy		
	All raters overall no eASPECTS	All raters overall with eASPECTS	eASPECTS
M1	80.70%	87.10%	90.00%
M2	69.00%	83.60%	91.70%
M3	80.80%	87.10%	93.30%
M4	87.50%	93.50%	95.00%
M5	78.00%	86.00%	93.30%
M6	87.10%	91.70%	95.00%
C	80.10%	79.00%	73.30%
L	66.60%	71.50%	71.70%
In	68.40%	79.10%	85.00%
IC	85.10%	95.00%	100.00%

and 0.62 to 0.82 for the insula. Overall reader accuracy improved with the use of eASPECTS for every region with the exception of the caudate. For example, accuracy improved from 80.7% to 87.1% for M1, 69.0% to 83.6% for M2 and 85.1% to 95.0% for internal capsule. The eASPECTS software had higher accuracy than the overall cohort of readers (with and without eASPECTS assistance) for every region except the caudate.

Conclusions The use of Brainomix eASPECTS software result in significant improvements in the inter-rater agreement and accuracy of ASPECTS score evaluation in a large group of neuroradiologists and neurologists. Interestingly, the eASPECTS software was more predictive of final infarct/ASPECTS than the overall group of readers interpreting the CT scans with and without eASPECTS assistance.

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E-157 ARTIFICIAL INTELLIGENCE DETECTION OF CEREBRAL ANEURYSMS USING CT ANGIOGRAPHY – PROOF OF CONCEPT

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Introduction Brain Aneurysms (BAs) are a prevalent vascular disease that may cause a life-threatening intracranial hemorrhage. They can often be missed in CTA and MRAs because the diagnosis requires a very methodological approach. Machine learning algorithms have been used to detect large vessel occlusion and other vascular brain conditions. We developed an algorithm using deep neural network to detect and assist BAs.

Methods We developed an algorithm using 3D convolutional neural network modeled as U-net to detect BAs. We used consecutive positive and negative CTAs in two institutions from 2015–2017. The data was annotated by experienced researchers and checked by an experience neuroradiologist. The algorithm construction used initially 179 CTA datasets containing 230 BAs as a training set. After an initial assessment and algorithm optimization, we use 528 CTAs containing 674 BAs and 2400 normal scans as validation set. We aim to perform a blind test on the algorithm to assess its accuracy on detection of BAs using a test set of 300 positive CTAs with BAs independent of the rupture status and larger than 5 mm and 900 negative scans as controls consecutively selected matched by age and sex. We used ROC curves and Pearson correlation tests to assess the algorithm.

Results We are submitting preliminary results of a blind test of 50 positive CTAs and 150 controls. The algorithm achieved a sensitivity of 92% and a specificity of 94% (AUC 0.983). At the time of the conference, we aim to present the complete analysis and subgroup analysis per location, size and rupture status.

Conclusion The Viz. ai aneurysm algorithm was able to accurately detect the majority of brain aneurysms from our blind test dataset. More importantly, it was also able to report consistently the negative scans. Further training should improve even more accuracy particularly on small aneurysm sizes.

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