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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