Evaluation of Brainomix e-CTA Software in the Diagnosis of Large Vessel Occlusion Stroke

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Background

- AI software can potentially expedite the radiological diagnosis of stroke.[1, 2, 3]
- NICE has authorised the use of selected AI systems in clinical practice.[4]
- The East of England Regional Stroke Network has integrated Brainomix into its stroke pathway.

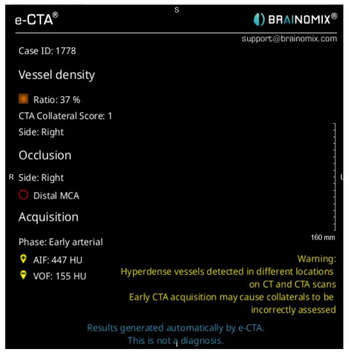
Aims

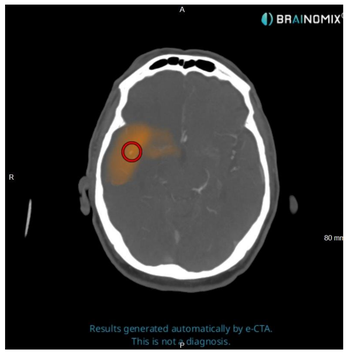
- To assess the real-world sensitivity and specificity of the Brainomix e-CTA module.
  - In its intended purpose of detecting anterior circulation LVO.
  - In detecting all ischaemic strokes.

Methods

- Retrospective audit of sequential CTAs for acute stroke
- Addenbrooke's Hospital only, not spoke hospitals
- 1st September 23 - 1st March 24 (400 sans)
- Comparison of e-CTA and Consultant Neuroradiologist report as gold standard
  - Presence of occlusion

Example e-CTA Output



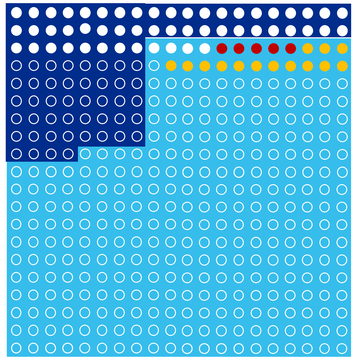


Results

Anterior LVO		
Accuracy	Sensitivity	Specificity
88%	92%	87%

All Occlusions		
Accuracy	Sensitivity	Specificity
83%	68%	87%

Results



400 patients

- 52 Anterior LVO
- 5 Anterior MeVO
- 14 Posterior LVO
- 92 e-CTA positive
- 237 e-CTA negative

False Negative Cases

MT Offered	7
Anterior LVO	3
Posterior LVO	4

MT Not Offered	16
Irreversible Infarct	2
Too distal	3
Clinical Improvement	6
High Baseline mRS	1
Low NIHSS	3
Site of occlusion not consistent with symptoms	1

Real Terms

- For each 2 positive e-CTAs, 1 is a false positive
- For every 13 negative e-CTAs, 1 MT candidate is missed

References

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2. Hoelter P, Muehlen I, Goelitz P, Beuscher V, Schwab S, Doerfler A. Automated ASPECT scoring in acute ischemic stroke: comparison of three software tools. *Neuroradiology*. 2020;62(10):1231-1238. doi:https://doi.org/10.1007/s00234-020-02439-3

3. Goebel J, Stenzel E, Guberina N, et al. Automated ASPECT rating: comparison between the Frontier ASPECT Score software and the Brainomix software. *Neuroradiology*. 2018;60(12):1267-1272. doi:https://doi.org/10.1007/s00234-018-2098-x

4. Overview | Artificial intelligence (AI)-derived software to help clinical decision making in stroke | Guidance | NICE. www.nice.org.uk. Published January 23, 2024. https://www.nice.org.uk/guidance/DG57