

Objective: Compare diagnostic accuracy of different mobile devices in acute CT interpretation for various ischemic stroke findings among various readers.

Subjects/methods: After IRB approval, 20 selected AIS CTs were independently interpreted by 11 readers (7 neurologists/3 neuroradiologists/1 radiologist) on 2 mobile devices: iPad®2 (1024 × 768 pixels) and iPhone®4 (960 × 640 pixels), and on a Picture Archiving and Communication System (PACS) workstation (1280 × 1024 pixels). Mobile devices used FDA-cleared ResolutionMD software (ResMD® Calgary Scientific, Calgary, Canada). Primary outcome measures: any acute ischemic sign (AIS), any non-acute ischemic sign (NAIS), and hyperdense middle cerebral artery (HMCA) sign. Intra-rater and inter-device accuracy, using a rater specific gold standard, was evaluated; estimated % sensitivity (Sen) and % specificity (Spe) with 95% Agrest-Coull confidence intervals (CIs) were calculated.

Results: Across all 11 readers, for AIS: Sen = 76 (68, 82) and Spe = 75 (64, 83) on iPhone; Sen = 76 (69, 83) and Spe = 71 (60, 80) on iPad. For NAIS: Sen = 80 (72,86) and Spe = 77 (67, 84) on iPhone; Sen = 75 (67, 82) and Spe = 80 (71, 87) on iPad. For HMCA: Sen = 53 (39, 67) and Spe = 97 (93, 99) on iPhone; Sen = 62 (48, 75) and Spe = 95 (91, 98) on iPad.

Conclusions: We believe this is the first study directly comparing the diagnostic accuracy of two different mobile devices for AIS on head CT. Both iPhone and iPad have fair sensitivity for detection of AIS and NAIS, but poorer sensitivity for HMCA when read by readers from different specialties. Specificity was good–excellent for all 3 CT findings. iPhone and iPad have similarly good diagnostic accuracy for AIS supporting their use for remote neuroimaging interpretation. Validation in clinical practice needs to be confirmed.

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Stroke 1

Comparative analysis of recanalization treatments in basilar artery occlusion

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Background: Basilar artery occlusion (BAO) is the most devastating form of stroke, and the current wisdom is to reverse it with aggressive revascularization treatments. Recent trials using endovascular stentriever have shown efficacy in anterior circulation, but did not recruit posterior circulation occlusions. The preferred approach in BAO remains unknown.

Objective: This study collected published series of recanalization treatments in BAO to determine relative efficacy.

Patients and methods: We analyzed systematically the reported outcomes produced in 17 cohorts published from 2005 comprising 803 patients. Predictors of futile recanalization (FR; 3-month mRS score 4 to 6) were determined in the largest cohort (162, Helsinki).

Results: Superior results were achieved by primary thrombectomy with recanalization in 91% and good outcome (mRS 0 to 2) in 36%. Still, there was a substantial FR rate at 60%, which was improved using modern stentriever only (52.8%). Good outcome was reported by mechanical approaches either alone or on-demand more frequently

than by exclusively pharmacological protocols (35.5% vs. 24.4%, $p < 0.001$) in line with higher recanalization rates (84.1% vs. 70.9%, $p < 0.001$). In the largest single-center cohort, the most significant predictor was extensive baseline ischemia, increasing the odds of futility 20-fold (95% CI 4.4–92.3, $p < 0.001$). Ventilation support increased FR 7-fold (2.1–23.7, $p < 0.01$).

Conclusion: Modern stentriever approaches have reported superior outcome rates over exclusively pharmacological thrombolysis protocols in BAO. However, still more than half of the recanalizations turn out futile. To improve this, more careful patient selection is needed, especially to exclude patients with an already extended baseline ischemia.

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Stroke 1

PIAST – Platelet inhibition assessment in stroke trial multiplate analyzer based assessment of the efficacy of antithrombotic medication in stroke patients

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Objective: The aim of this prospective trial was to assess 1) the percentage of patients being treated with antiplatelet medications (AM) prior to or for secondary prevention of stroke who disclose an insufficient platelet aggregation (PA) inhibition assessed with Multiplate (MEA) – a validated platelet function test – and 2) conditions that might contribute to PA.

Background: A significant number of patients suffer from a recurrent cerebral ischemia despite treatment with AM without detectable progression of the underlying illness likely due to antiplatelet non-responsiveness caused by different factors. Platelet function was analyzed through MEA to identify the effects of antiplatelet therapy in stroke patients. Furthermore, the question if aspirin related insufficient platelet inhibition is correlated with the clinical diagnosis is addressed.

Methods: We analyzed the platelet function of 455 patients admitted with a suspected stroke either prior to being treated with aspirin and clopidogrel or being newly placed on AM employing MEA.

Results: Data shows that 120 (26.3%) of all examined patients with suspected ischemic stroke fall into the category of potential resistance to antiplatelet agents, mounting to 30% of the eventually confirmed 400 cerebral ischemia patients. Increased inflammatory biomarkers and use of NSAIDs was associated with an elevated PA and stroke/TIA incidence. Diabetes mellitus and decreased renal function do not seem to have an impact though. Insufficient PA seems to correlate with an increased rate of cerebral ischemia.

Conclusion: Nearly 1/3 of cerebral ischemia patients are potential aspirin nonresponders, which might have significant implications in the medical treatment of stroke patients.

I have obtained patient and/or Institutional Review Board (IRB) approval, as necessary

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