Patients with large vessel occlusion and target mismatch on imaging may be thrombectomy candidates in the extended time window. However, the ability of imaging modalities including non-contrast CT Alberta Stroke Program Early Computed Tomographic Scoring (CT ASPECTS), CT angiography collateral score (CTA-CS), diffusion-weighted MRI ASPECTS (DWI ASPECTS), DWI lesion volume, and DWI volume with clinical deficit (DWI + NIHSS), to identify mismatch is unknown.

We defined target mismatch as core infarct (DWI volume) of < 70 mL, mismatch volume (tissue with TMax > 6 s) of ≥ 15 mL, and mismatch ratio of ≥ 1.8. Using experimental dismantling design, ability to identify this profile was determined for each imaging modality independently (phase 1) and then with knowledge from preceding modalities (phase 2). We used a generalized mixed model assuming binary distribution with PROC GLIMMIX/SAS for analysis.

We identified 32 patients with anterior circulation occlusions, presenting > 6 h from symptom onset, with National Institute of Health Stroke Scale of ≥ 6, who had CT and MR before thrombectomy. Sensitivities for identifying target mismatch increased modestly from 88% for NCCT to 91% with the addition of CTA-CS, and up to 100% for all MR-based modalities. Significant gains in specificity were observed from successive tests (29, 19, and 16% increase for DWI ASPECTS, DWI volume, and DWI + NIHSS, respectively).

The combination of NCCT ASPECTS and CTA-CS has high sensitivity for identifying the target mismatch in the extended time window. However, there are gains in specificity with MRI-based imaging, potentially identifying treatment candidates who may have been excluded based on CT imaging alone [1)].

1)
DiBiasio EL, Jayaraman MV, Goyal M, Yaghi S, Tung E, Hidlay DT, Tung GA, Baird GL, McTaggart RA. Dismantling the ability of CT and MRI to identify the target mismatch profile in patients with anterior circulation large vessel occlusion beyond six hours from symptom onset. Emerg Radiol. 2019 Mar 31. doi: 10.1007/s10140-019-01686-z. [Epub ahead of print] PubMed PMID: 30929145.