O-026

REAL WORLD EVIDENCE FOR ACUTE STROKE THROMBECTOMY IN THE UNITED STATES FROM THE NEUROVASCULAR QUALITY INITIATIVE-QUALITY OUTCOMES DATABASE

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Background and Purpose Multiple randomized controlled trials demonstrated the significant clinical benefit of endovascular stroke thrombectomy in anterior circulation large vessel occlusions (LVO) within 6 hours. More recent trials have shown the benefit to extend up to 24 hours with advanced imaging selection. We aim to present real-world evidence for endovascular thrombectomy (EVT) practiced in the United States using the Neurovascular Quality Initiative (NVQI) registry.

Methods Data from the NVQI registry was analyzed for anterior circulation acute ischemic strokes treated with EVT in 23 US centers (17 states) from Feb 2015 to Oct 2019.

Results Anterior circulation EVT was performed in 90.5% (2808/3103 patients). LVO sites were most common in the MCA (74%) vs. the ICA (25% cervical and/or terminus) with few isolated ACA occlusions (1%). Mean age at intervention was 68.8 ± 15.4 (48.6% male) presenting with a mean NIHSS of 15.8 ± 6.8 . ASPECTS was reported in 69.2% of cases with only 47.9% presenting with ASPECTS ≥ 7 . CT/CTA was performed in 94% of cases whereas MRI/MRA was limited to 14%. The median arrival to groin puncture time was 87 min, onset to groin time was 291 min, and procedure time was 33 min. 43.1% of patients received IV rtPA. 84% of cases were successfully treated (TICI 2b/3 reperfusion), 45% reported single pass successful recanalization, with 3.9% technical failures (2.3% access related). Intraprocedural complications were reported in 4.6% of cases (0.4% vessel perforations, 0.5% hemorrhagic transformations, 1.1% non-target embolization, and 1.2% iatrogenic dissections). Mean post-operative length of stay was 8.5 ± 11.4 days, with 11.2% in-hospital mortality. 90 day follow-up mRS was reported in 67.5% of cases with mRS ≤ 2 achieved in 37.3% and 90-day mortality reported in only 1.3% of cases. Missing data were most common in technical failure, intraprocedural complications, and 90-day mRS amounting to 13.5%, 15.3% and 32.5% of cases, respectively.

Conclusion Stroke thrombectomy practices, procedural metrics, and outcomes from the NVQI registry mirrors the findings from the HERMES meta-analysis confirming the real-world practice and evidence for EVT in the US. Stricter quality reporting guidelines, improving clinical follow up, and the potential for automated imaging data adjudication will transition quality reporting infrastructures to be utilized for regulatory device monitoring, expanding indications, clinical trials, and value-based reimbursements.

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O-027

FAVORABLE VENOUS MICROVASCULAR PROFILE IS ASSOCIATED WITH SMALLER ISCHEMIC LESION GROWTH AND SMALLER FINAL CORE INFARCTION VOLUME IN PATIENTS WITH ACUTE ISCHEMIC STROKE DUE TO LARGE VESSEL OCCLUSION

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Purpose In the event of an acute ischemic stroke due to large vessel occlusion (AIS-LVO), patients with large core infarction and malignant edema have worse outcomes. Core infarction size growth is caused by poor cerebral blood flow and impaired microvascular perfusion. Cerebral microvascular perfusion is governed by the in-flow of arterial blood to the brain tissue, but also likely by the outflow of blood through the cerebral veins. Venous blood flow in the context of AIS-LVO may better indicate the overall quality of tissue perfusion, as it reflects blood flow after passing the brain tissue. We determined if the venous microperfusion profile (VMP) predict ischemic lesion growth and final infarct core in AIS-LVO patients.

Materials and Methods We performed a multicenter, retrospective cohort study of AIS-LVO patients undergoing thrombectomy triage with CT angiography (CTA) and CT perfusion (CTP). Patients with motion artifact and incomplete electronical medical data were excluded. Patient details were obtained from prospectively maintained stroke databases and the electronic medical record. VMP was determined by opacification of the vein of Labbé, sphenoparietal sinus, and superficial middle cerebral vein on pre-thrombectomy CTA as: 0, not visible; 1, moderate opacification; and 2, full. Brain edema progression and infarct growth as assessed by Net Water Uptake (NWU), which was calculated on pre-treatment and post-thrombectomy non contrast computed tomography images using manual regions of interest. Primary outcome measure was ischemic lesion growth after thrombectomy. Secondary outcome was final core infarction volume, which was manually segmented on follow-up CT and MRI studies 24–48 hours after thrombectomy.

Results 250 patients met inclusion criteria. Median patient age was 76 (IQR 65–82). 50% were female. Linear regression models found that increased patient age ($p=0.011$), higher blood glucose levels ($p=0.007$), lower TICI scores ($p<0.001$) and reduced VMP ($p<0.001$) predicted increased core infarction growth (higher NWU). In a multivariate regression analysis, poor VMP predicted core infarct growth while controlling for age, blood glucose, and TICI score ($\beta=-2.111840$, [95% CI -2.808059256 -1.41562150]; $p<0.001$). In a secondary analysis focused on final infarct core, we excluded 5 patients due to missing final infarct size data. After controlling for age, blood glucose, and TICI score, poor VMP predicted higher final core infarct size ($\beta=-22.57626$, [95% CI -30.7799325 -14.3725813]; $p<0.001$).