

Oral Abstracts

O-001 PREDICTORS OF THE FIRST PASS EFFECT WITH NEUROTHROMBECTOMY FOR ACUTE ISCHEMIC STROKE

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Introduction Achieving complete revascularization after a single attempt with mechanical thrombectomy (First pass effect, FPE) in the setting of an acute ischemic stroke due to large vessel occlusion (LVO) is associated with significantly higher rates of a good clinical outcome. We aim to identify predictors of FPE in a large real world registry of patients undergoing thrombectomy.

Methods Data were analyzed from the STRATIS registry – a prospective, nonrandomized study of patients undergoing neurothrombectomy with the Solitaire device. A total of 984 patients treated at 55 sites were analyzed. Univariate and multivariable logistic regression was used to assess the relationship between patient characteristics (demographics, clinical, occlusion location, collateral grade) and procedural features with FPE. Complete data was only available for 930 patients.

Results First pass effect was achieved in 40% (ns=372) of patients. Patients in the FPE group were older (69 ±15 vs 67 ±15 years, p=0.02) and had less internal carotid artery (ICA) occlusions (17% vs 28%, p=0.001). While rates of symptomatic intracranial hemorrhage (0.6% vs 2.2%, p=0.13) were comparable, rates of mRS 0–2 at 90 days were higher (66% vs 49%, p≤0.001) and mortality at 90 days (12% vs 19%, p=0.008) were lower in the FPE group compared to the non-FPE group. Multivariable regression analysis identified absence of ICA occlusion (p=0.01), the use of a balloon guided-catheter (p=0.001) and better collateral grade (p≤0.001), as independent predictors of FPE.

Conclusion Non-ICA site of occlusion, the use of a balloon-guided catheter and better collateral grade are independent predictors of FPE. Further understanding of these factors may influence choice of thrombectomy device and technique.

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O-002 PREDICTORS OF UNFAVORABLE OUTCOMES AND MORTALITY DESPITE SUCCESSFUL RECANALIZATION: AN ANALYSIS OF ARISE II DATA

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Background A significantly large number of patients with emergent large vessel occlusion (ELVO) fail to achieve favorable outcomes despite successful recanalization. Why some patients do not achieve functional independence despite successful revascularization is an important question. There is a paucity of prospective data on the predictors of unfavorable outcomes despite successful recanalization during mechanical thrombectomy for ELVO.

Objective This study was performed to determine the predictors of unfavorable outcomes in patients receiving successful recanalization (modified thrombolysis in cerebral infarct, mTICI grade ≥2b) in a prospective multicenter cohort of patients with ELVO.

Methods This was a secondary analysis of data collected from ARISE II study (Analysis of Revascularization in Ischemic Stroke With EmboTrap). ARISE II was a prospective, multicenter single arm study on the efficacy of EmboTrap Revascularization Device. Patients who achieved mTICI score of 2b or greater within 3 passes were included in this study. Patients with incomplete follow up were excluded from the study. A univariate and multivariate logistic regression was performed to determine the independent predictors of unfavorable outcomes at 90 days (defined as mRS 3–6). The variables tested as predictors included age, gender, collateral grade, ASPECTS, mode of transfer, National health institute stroke scale (NIHSS) score, use of intravenous tissue plasminogen activator, number of passes, clot location, final mTICI and symptomatic intracranial hemorrhage (sICH). Odds ratio (OR) with 95% confidence interval (CI) were reported.

Results One hundred seventy six patients were included in this secondary analysis of ARISE II data. Unfavorable outcomes (mRS=3–6) at 3 months were seen in 52 (29.6%) patients. Females constituted 54.88% of total population. Mean age was 67.15 years. Mean NIHSS score was 15.85±4.71. M1 was the most common site of occlusion with 54.55% followed by M2 (25.0%) and ICA (15.91%). Delay from stroke onset to the deployment of stent retriever was 3.97±1.44 hours. Ninety (51.14%) patients required a single pass. On univariate logistic regression analysis age, ASPECTS, collateral grade, time from stroke onset to the deployment of stent retriever, duration of procedure, NIHSS score, and sICH were found to be significant predictors of unfavorable outcomes. On multivariate analysis collateral grade (OR, 0.24, 95% CI 0.06–0.94, p value 0.04), NIHSS score (OR 1.28, 95% CI 1.15–1.43, p value <0.001), and number of passes (OR, 2.08, 95% CI 1.40–3.10, p value 0.0003) were found to be independent predictors of unfavorable outcomes in patients with successful recanalization.

Abstract O-002 Table 1 Multivariable logistic regression model of 90-day mRS failure

Parameter ^[6]	Estimate	Odds Ratio		P-value
		95% Lower Limit	95% Lower Limit	
Collateral Grade ^[7]	0.24	0.06	0.94	0.0404
NIH Stroke Score (per point)	1.29	1.12	1.49	0.0003
Num. of Passes (per pass)	1.90	1.10	3.28	0.0224

Conclusion Collateral grade, NIHSS score at presentation, and number of passes are independent predictors of unfavorable outcomes at 90 days.

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O-003 PREDICTORS OF SUCCESSFUL REVASCULARIZATION IN THE ARISE II STUDY

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Introduction Swift and complete revascularization in large vessel occlusion (LVO) stroke is associated with better functional outcomes. First pass effect (FPE), achievement of TIC1 2C/3 revascularization on the first pass, is a new metric of technical success of endovascular thrombectomy (EVT). We aim to identify predictors of FPE and TIC1 3 revascularization in the ARISE II study.

Methods Anterior circulation LVO [ACLVO-internal carotid (ICA) and middle cerebral artery (MCA-M1)] strokes from the ARISE II study were used for this analysis. Core-lab adjudicated TIC1 scores after the first pass of EmboTrap were collected. FPE and modified FPE (mFPE) were defined as first pass achievement of TIC1 2C/3 and TIC1 ≥2B, respectively. Demographic, clinical and radiographic parameters were analyzed. Multivariable logistic regression was performed to identify predictors.

Results A total of 161 ACLVOs underwent thrombectomy in the ARISE II study. Mean age was 67 ±13 years and 43% (n=69) were male. Mean NIHSS and median ASPECTS were 16 ±5 and 10, respectively. While FPE was achieved in 37% (n=59), mFPE was seen 43% (n=69) patients. Multivariable logistic regression was performed using age, sex, use of IV-tPA, BMI, NIHSS, vascular risk factors, ASPECTS, collateral status (ASITN), occlusion location and use of balloon-guided catheter as variables. While absence of ICA occlusion (p=0.07, OR-8.6, 0.8–90) can predict FPE, there were no independent predictors of mFPE. Independent predictors of TIC1 3 after 3 passes include use of balloon guide catheter (p=0.01, OR-0.033, 0.003–0.535) and higher ASITN score (p=0.04, OR-10.2, 1–100).

Conclusion Absence of internal carotid artery occlusion predicts FPE and the use of balloon guide catheter and favorable collaterals predicts complete revascularization. These results support the consideration of routine BGC use with the Embo-trap device to achieve complete revascularization.

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O-004 CHANGES IN GENE EXPRESSION OF CXCL9 IN INTRACRANIAL DISTAL BLOOD DURING EMERGENT LARGE VESSEL OCCLUSION IN HUMAN STROKE

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Background and purpose Mechanical thrombectomy (MT) is the standard of care for emergent large vessel occlusion (ELVO), one of the most severe subtypes of ischemic stroke, which accounts for 30–40% of all cases. Through MT, we can isolate distal blood within the artery immediately downstream from the clot and compare it to systemic arterial blood to provide insight into local intraluminal changes during ischemia. CXCL9 is an interferon gamma-inducible chemokine that binds CXCR3, degrading endothelial tight junctions, attracting T cells, and facilitating immune cell extravasation into brain parenchyma. We aimed to study local CXCL9 expression distal to the intracranial thrombus during large vessel occlusion in human patients.

Methods Tissue samples of distal and proximal blood were collected as part of the BACTRAC tissue bank (www.clinicaltrials.gov NCT03153683). Adult subjects with ELVO were prospectively enrolled, and arterial blood distal (intracranial) and proximal (cervical) were collected and processed to optimize RNA quality. RNA were isolated and used to evaluate gene expression in both samples for each subject; proximal systemic blood was used as an internal control for each subject.

Results 22 subjects were included in this preliminary analysis. 15 (68.2%) were female. 54.5% of subjects had a CTA collateral score of 1 (18.2% had a score of 0). 4.5% (1 subject) did not attain TIC1 2B or 3 recanalization. Infarct time (last known normal to thrombectomy recanalization) was 491 ± 243 minutes. Mean change in NIHSS from admission to discharge was -8 ± 8. CXCL9 expression in distal blood was upregulated an average of 106-fold with a maximum upregulation of 805-fold in one subject. In plotting CXCL9 expression against infarct time, there was a clear negative correlation (Spearman coefficient -0.43, p=0.05).

Conclusion For the first time, we evaluate chemokine alterations in human stroke patients in distal stagnant blood during ELVO. There is a significant variance in CXCL9 expression in distal blood in relationship to infarct time, which mirrors the known timing of blood-brain barrier disruption.