O-072 CHARACTERISTICS OF A COVID-19 COHORT WITH LARGE VESSEL OCCLUSION: A MULTICENTER INTERNATIONAL STUDY

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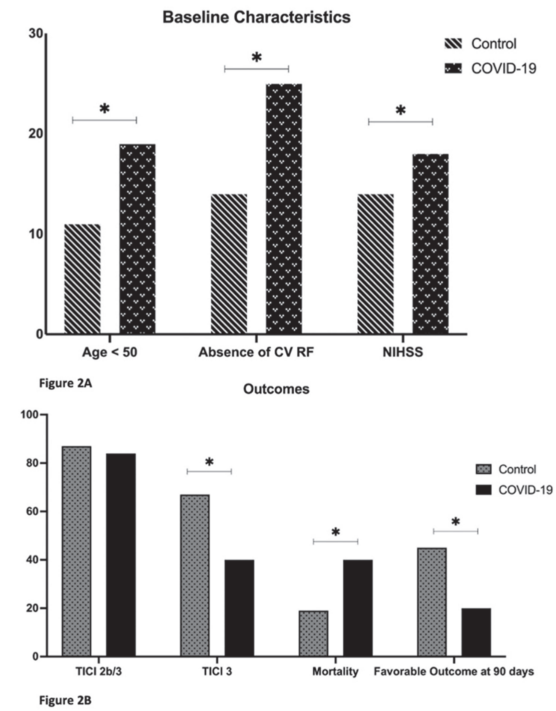
Background The mechanisms and outcomes in COVID-19-associated stroke are unique from those of non-COVID-19 stroke.

Objectives The purpose of this study is to describe the efficacy and outcomes of acute revascularization of large vessel occlusion (LVO) in the setting of COVID-19 in an international cohort.

Methods We conducted an international multicenter retrospective study of consecutively admitted COVID-19 patients with concomitant acute large vessel occlusion (LVO) across 50 comprehensive stroke centers. Our control group



Abstract O-072 Figure 1

Abstract O-072 Table 1

Variable	Univariate			Univariate after Propensity Score Analysis			Multivariate after Propensity Score Analysis		
	OR	95 % CI	P-value	OR	95 % CI	P-value	OR	95 % CI	P-value
Gender (Female)	0.9	0.6 – 1.5	0.736						
Increasing Age	1.0	1.0 – 1.0	0.012	1.0	1.0 – 1.0	**0.038**	1.0	1.0 – 1.1	**0.016**
COVID-19	1.9	1.2 – 3.1	**0.004**	2.5	1.3 – 5.1	**0.008**	2.6	1.1 – 5.8	**0.025**
NIHSS at Admission	1.1	1.1 – 1.1	**< 0.001**	1.1	1.1 – 1.2	**<0.001**	1.1	1.0 - 1.1	**0.005**
Baseline Functional Status	1.6	1.1 – 2.4	0.011	2.3	1.1 – 4.9	**0.026**			
Chronic Heart Disease	0.8	0.5 – 1.5	0.619						
Chronic Lung Disease	0.9	0.5 – 1.6	0.821						
Chronic Kidney Disease	1.5	0.6 – 3.5	0.348						
Chronic Liver Disease	2.6	0.6 – 11.7	0.205						
Hypertension	1.4	0.8 – 2.2	0.186						
Diabetes Mellitus type II	1.4	0.8 – 2.4	0.180	2.5	1.2 – 5.5	**0.019**			
Atrial Fibrillation	0.8	0.5 – 1.3	0.359						
ASPECTS	0.8	0.7 – 0.9	**0.002**	0.7	0.6 – 0.9	**0.005**			
Number of Vessels Involved	1.1	0.7 – 1.7	0.578						
LVO Location (Anterior Circulation)	1.2	0.5 – 2.8	0.682						
tissue – Plasminogen Activator	0.8	0.5 – 1.2	0.267						
Onset to Door	1.0	0.9 – 1.0	0.280	1.0	1.0 – 1.0	**0.045**			
Onset to Arterial Access	0.9	0.9 – 1.0	**0.031**	1.0	1.0 – 1.0	**0.035**			
General ET Intubation	0.8	0.5 – 1.4	0.448						
Stenting	0.9	0.5 – 1.9	0.908						
Procedure Duration	1.0	0.9 – 1.0	0.053						
TICI 2B – 3	0.4	0.2 – 0.8	**0.009**	0.6	0.4 – 0.9	**0.015**	0.6	0.4 – 1.0	**0.042**

Table 3: Univariate and Multivariate analysis for variables associated with Unfavorable Outcomes (mRS 3-6) before and after propensity score analysis.
(Bold values indicate statistically significant value p ≤ 0.05)

constituted historical controls of patients presenting with LVO and receiving a MT between January 2018 to December 2020.Results: The total cohort was 575 patients with acute LVO, 194 had COVID-19 while 381 patients did not. Patients in the COVID-19 group were younger (62.5 vs. 71.2; p<0.001), and lacked vascular risk factors (49, 25.3% vs. 54, 14.2%; p =0.001). mTICI 3 revascularization was less common in the COVID-19 group (74, 39.2% vs. 252, 67.2%; p < 0.001). Poor functional outcome at discharge (defined as mRS 3–6) was more common in the COVID-19 group (150, 79.8% vs.132, 66.7%; p =0.004). COVID-19 was independently associated with a lower likelihood of achieving mTICI 3 (OR: 0.4, 95% CI: 0.2 –0.7; p<0.001), and unfavorable outcomes (OR: 2.5, 95% CI: 1.4 – 4.5; p=0.002).

Conclusion COVID-19 was an independent predictor of incomplete revascularization and poor outcomes in patients with stroke due to LVO. COVID-19 patients with LVO patients were younger, had fewer cerebrovascular risk factors, and suffered from higher morbidity/mortality rates.

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SNIS 19th annual meeting oral poster abstracts

P-001 EVALUATION OF CEREBROVASCULAR FLOW PARAMETERS RELATIVE TO GUIDE CATHETER POSITION DURING ACUTE ISCHEMIC STROKE TREATMENT

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Introduction/Purpose Studies show aspiration catheters with a high catheter-to-vessel ratio (catheter bore that closely matches the vessel diameter) achieve improved recanalization results. Additionally, higher rates of First Pass Effect result from proximal flow arrest using a balloon guide catheter (BGC). The purpose of this study is to quantify the effect of intracranial flow parameters using various catheter combinations for aspiration thrombectomy.

Materials and Methods Using the Bioengineering Devices Laboratory benchtop flow model at Northern Arizona University, real-time flow and pressure measurements of catheter placement in the circle of Willis (CoW) model were recorded using various aspiration catheters placed at the middle cerebral artery (MCA) within guide catheters placed in the internal cerebral artery (ICA): Zoom 71 (Imperative Care, Z71) within Neuron MAX (Penumbra, NM), Z71 within Ballast (Balt, Ball), Z71 within Walrus (Q'APel Medical, W-BGC), React 68 (Medtronic, R68) within FlowGate2 (Stryker, F-BGC), and Zoom 88 (Imperative Care, Z88) alone in the MCA. The flow model consisted of a programmable, SuperPump AR (ViVitro Labs) that simulated physiological neurovascular flows and pressures. The benchtop accommodated swappable 3D-printed CoW models made from UV-cured acrylic-based co-polymers, with anatomical dimensions (Rai et.al., JNIS, 2013) and mechanical properties of human vessels (Norris et.al., JBMR 2021) (**figure 1-Top**). The flow model also incorporated a novel blood analog, matched to the viscosity and shear-thinning effect of blood, for simulating real-time pressure and flow measurements at each CoW branch.

Results All catheter combinations resulted in significant flow reduction in the affected middle cerebral artery (MCA), with ~60% reduction using standard 8F guide catheters in the ICA and 6F aspiration catheters in the MCA. However, Z88 placement within the MCA for aspiration resulted in 96% flow reduction. A Z71 in the MCA, within a Z88 distal to the PComm (proximal to the carotid terminus), resulted in 80% flow reduction, similar to an R68 in the MCA within an inflated F-BGC in the proximal ICA. However, the inflated F-BGC also resulted in significantly larger flow reduction in the ipsilateral ACA (**figure 1 Bottom**).

Conclusion Dramatically reduced MCA flow can significantly reduce downstream migration of thrombus during thrombectomy. This study demonstrates that Zoom 88 positioned distal to the PComm achieved similar rates of flow control as balloon guide catheters inflated in the proximal ICA. In all cases, flow compensation within the CoW affected the outflow rates

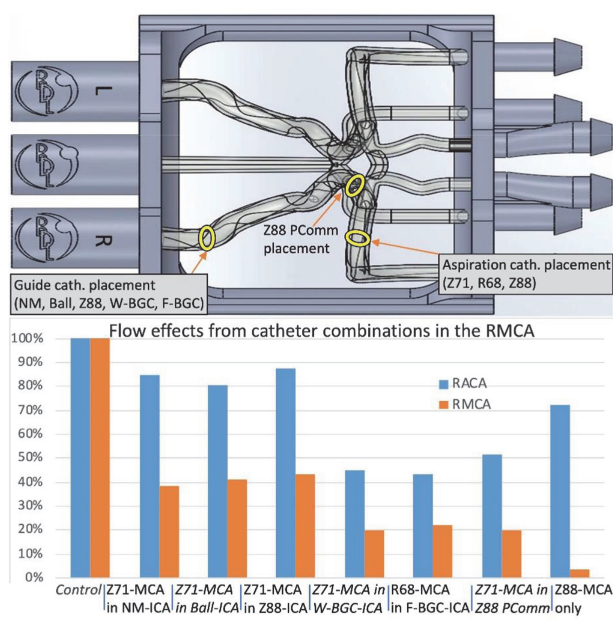

***Figure 1: Top)** CAD version of the CW model, with catheter placements labeled, **Bottom)** resulting RMCA and RACA outflows during catheter placement in the RMCA*

Abstract P-001 Figure 1