26%; $p=0.0034$), while patients with PD were less likely to be discharged home in the group without thrombectomy (32% vs. 51%; $p<0.0001$). Length of hospital stay was similar between groups (range 4.3 – 8.7 days). Inpatient mortality was significantly higher in patients with AD (5% vs. 4%; $p<0.0001$) and PD (5% vs. 4%; $p=0.044$) in the group that did not undergo MT.

Conclusions Patients with co-existing neurological disorders underwent mechanical thrombectomy at a lower rate compared to other patients. Further studies should elucidate factors affecting the rate MT in the United States.

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E-090 NOVEL ASPIRATION CATHETER WITH HYDRO-SEPARATOR TECHNOLOGY FOR TOUGH CLOTS

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Background Large-clot burden and fibrin clots remain challenging for mechanical thrombectomy. The aim of this study is to assess a new-generation aspiration system with hydro-separator technology that works regardless of clot size or composition.

Materials and Methods The Neurostar thrombectomy system is comprised of a 6F Neurostar catheter and a Saline Drive Unit (SDU) with a peristaltic pump, which creates a stream of saline on the tip of the catheter to macerate the thrombus during aspiration (hydro-separator). The Neurostar catheter as well as two commercially available thrombectomy devices, the Solitaire FR stent retriever and Sofia Plus aspiration catheter, were tested to compare single-pass recanalization performance in challenging situations. Fibrous clots and cohesive erythrocyte-rich clots were produced from porcine blood. A segment of fibrous clot was placed in the MCA distal to M1 and proximal to M2 in a tortuous in-vitro intracranial vascular model, or a relatively long (20 mm) erythrocyte-rich clot was placed in the middle segment of the M1. Mechanical thrombectomy using each device was repeated 10 times with fibrous clots and erythrocyte-rich clots. Success recanalization was defined as clot removal without visible fragmentation or migration.

Results The Neurostar catheter led to significantly better single-pass recanalization performance (18/20) compared to the Sofia Plus aspiration catheter (11/20) and Solitaire FR stent retriever (10/20). All of the recanalization procedures with the Sofia Plus required complete removal of the catheter because the clot was stuck at the tip or could not be ingested entirely. In contrast, the Neurostar catheter could ingest the clot and remain at the site of occlusion in all of the successful single pass recanalization procedures.

Conclusions Mechanical thrombectomy with the new aspiration system with hydro-separator resulted in higher success rates than a commercially available stent retriever and aspiration catheter in this experimental model. Further in vivo studies should be performed to confirm its performance.

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E-091

HIGH INFARCT GROWTH RATE IS ASSOCIATED WITH POOR FUNCTIONAL OUTCOME IN PATIENTS WITH ACUTE LARGE VESSEL OCCLUSION AND SUCCESSFUL REVASCULARIZATION

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Introduction Despite successful revascularization (TICI 2b or 3), almost half of the acute ischemic stroke patients with large vessel occlusion have a poor outcome. We aim to evaluate the extent by which collateral compensation is independently associated with functional outcome after successful recanalization.

Methods We retrospectively reviewed all acute ischemic stroke (AIS) patients with anterior large vessel occlusion (LVO) who underwent mechanical thrombectomy with successful revascularization in our comprehensive stroke center from 2014 to 2019. Inclusion criteria were age >18, time from last known well to reperfusion <24 hours, and patients who underwent CTP or MRI before and MRI after thrombectomy (within 24 hours). Ischemic core volume in CTP was measured as the relative CBF<30% volume of that normal tissue. MRI ischemic core volumes were calculated manually and by using Automatic Rapid Software (subtraction of 620 ACD volume-CBF<30% in the ischemic hemisphere). Infarct growth rate was defined as: (infarct volume post recanalization – infarct volume before recanalization)/(time from CTP or MRI before recanalization to MRI after recanalization). Functional outcome was measured by the modified Rankin Score (mRS) at 3 months dichotomized as good (mRS≤2) or poor (mRS>2). We used stepwise logistic regression to select variables for the final model. ROC curve analysis was done to identify the best cut-off for infarct growth rate.

Results We identified 123 patients met the inclusion criteria. Patients with poor outcome showed significant higher rates of age >80 (35% vs. 15%, $p<0.001$), female gender (60% vs. 46%, $p=0.024$), coronary artery disease (22% vs. 10%, $p=0.011$), atrial fibrillation (39% vs. 16%, $p<0.001$), and NIHSS>18 (55% vs. 24%, $p<0.001$) than patients with good outcome. Furthermore, patients with poor outcome had higher Tmax 10 sec (mean 62.2 sec vs. 44.4 sec, $p=0.021$) and infarct growth rate (mean 23.6 ml/h vs 8.3 ml/h, $p=0.007$). Whereas, the two groups were similar for the infarct volume before revascularization (mean 19.3 ml vs. 26.6 ml, $p=0.175$). Female sex (OR: 2.92, CI: 1.20 – 7.49), presence of atrial fibrillation (OR: 2.84, CI: 1.02 – 8.40), NIHSS>18 (OR: 3.44, CI: 1.35 – 9.21) and a higher infarct growth rate (OR:7.17, CI: 2.12 – 35.2) were independently associated with poor functional outcome at 3 months follow-up. Furthermore, the ROC analysis showed an infarct growth rate of 3 ml/h (AUC: 0.7) with the highest sensitivity (71%) and specificity (52%) for distinguishing between the slow and fast progressors.

Conclusions Failure of hemodynamic compensation measured by infarct growth rate represents an important predictor of poor functional outcome independent of recanalization. Early identification of transfer patients with greater infarct growth rates could help select those patients to alternative triaging systems such as direct to OR to minimize infarct progression.

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