

utilizing suction aspiration devices (Penumbra®, Alameda, CA). Total cost to patient for each case was calculated. Mean cost and standard deviation was calculated for each technique and compared using Student's t-test.

Results The total product cost to the patient for interventional management of vascular occlusions in a selected group of patients is given in the table.

Abstract E-045 Table 1

Suction aspiration		Stent retriever	
Vessel	Cost (US Dollars)	Vessel	Cost (US Dollars)
Left M1	29567.74	Left M1	57969.07
Left M1	72196.56	Left M1	57939.89
Right M1	30653.12	Right M1	63189.56
Right M1	69704.34	Right M1	64366.48
Right M1	29668.39	Right M1	58068.76
Mean	46358.03	Mean	60071.37
Standard Deviation	22470.99	Standard Deviation	2846.91
P-value	0.14		

Conclusion A cursory evaluation of the data from this selected subset of patients suggests that there may be no significant difference in overall product cost to the patient for utilization of these two techniques for performance of mechanical thrombectomy. However, upon closer inspection of the data, the cost for aspiration thrombectomy appears to vary quite widely across the subset, with a standard deviation of \$22470.99, while the standard deviation for stent retrieval is \$2846.91. It is difficult to determine whether this trend would be borne out in a larger sample set; however, it may suggest that product utilization in aspiration thrombectomy may vary considerably among operators and in varying situations while product utilization in stent retrieval thrombectomy may be more constant. Further exploration of this trend with larger patient subsets is warranted.

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E-046 PROCEDURAL EFFICIENCY OF THE STREAMLINED LAUNCHPAD STROKE ADMISSION PARADIGM – A SINGLE CENTER EXPERIENCE

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Introduction Time remains a crucial factor in stroke progression. Rapid and complete revascularization has been well correlated with favorable clinical outcome in patients with acute ischemic stroke secondary to large vessel occlusion. To mitigate the deleterious effects due to treatment delay, an initiative has been implemented to shorten the time for patient processing, expediting LVO patients for immediate intervention. The Launchpad protocol was established to ensure admitting stroke patients are triaged quickly and accurately identified in order to reduce time from arrival to intervention, and overall to revascularization. Herein, we assess the efficacy of the Launchpad paradigm in triaging presenting stroke patients.

Methods A retrospective review of the stroke database was conducted between September 2014 and January 2016,

3 months prior and 13 months post Launchpad implementation. Prior to Launchpad, patients presenting with stroke were triaged through the traditional Emergency Department (ED) pathway. Through Launchpad, incoming patients bypass the traditional ED pathway and are taken straight for a CT scan by a dedicated stroke team. A CT scan positive for LVO and penumbral tissues will permit patients to continue through the Launchpad pathway for further evaluation and subsequent intervention. Time differences during patient triage before and after Launchpad initiation are assessed to determine the efficiency of this paradigm.

Results In total, 764 patients were identified in the retrospective analysis, 137 were admitted prior, and 627 were admitted post Launchpad implementation. In the pre-Launchpad cohort, the median time from admission to CT imaging was 20 minutes. Patients under the Launchpad paradigm showed a reduction in time from presentation to imaging of 5 minutes ($p = 0.0004$). An increase in efficiency by roughly 25% to CT was observed following Launchpad implementation.

Conclusion The streamlined stroke activation Launchpad protocol demonstrated an increased speed in patient admission and significant reduction in time from presentation to CT scan. This significant improvement in processing time allowed for an increased number of patients to meet the therapeutic window for IV tPA eligibility. A prospective trial will strengthen the current finding and support the implementation of this paradigm amongst other stroke centers.

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E-047 DISTAL EMBOLI FOLLOWING ERIC THROMBECTOMY

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Introduction The use of clot retrievers during mechanical endovascular treatment of acute ischemic stroke can cause clot fragmentation with the release of distal emboli. It was our hypothesis that the risk of embolic shower may potentially be altered using the Embolus Retriever with Interlinked Cages (ERIC®) thrombectomy system. The objective of this study was the characterization of distal emboli generated during ERIC® thrombectomy device use as a function of access approach.

Materials and methods A hard, inelastic clot was prepared and injected into an anatomically correct circle of Willis (CoW) replica to form a middle cerebral artery occlusion. Thrombectomy was conducted per the manufacturer's instructions in four different groups ($n = 10$), each exploring different variables. In group 1, thrombectomy was performed using the ERIC® through an 8 F balloon guide catheter (BGC) positioned at the cervical ICA (ERIC®+BGC). In group 2, thrombectomy was performed using the ERIC® in conjunction with thromboaspiration via a 6 F Sofia intermediate catheter at the origin of the MCA (ERIC®+SOFIA). In group 3, thrombectomy was performed using the Solitaire in conjunction with thromboaspiration via a 6 F Sofia intermediate catheter at the origin of the MCA (Solitaire+SOFIA). Group 4 used the same setup as group 2 with the addition of proximal ICA flow arrest using a BGC during clot removal (ERIC®+SOFIA

+BGC). Emboli smaller than 1000 μm was characterized using the Coulter Principle. The primary endpoints were the size and quantity of the clot fragments generated during the procedure and the secondary endpoints were the flow recanalization rate and time to recanalization.

Results Formation of large emboli greater than 1000 μm in size occurred in 2 out of 10 cases in the ERIC[®]+BGC group, versus 7, 6 and 5 of 10 experiments with the ERIC[®]+SOFIA, Solitaire+SOFIA, ERIC[®]+SOFIA+BGC groups, respectively. The ERIC[®]+BGC group marginally reduced the number of emboli having a diameter $>200 \mu\text{m}$ ($p = 0.064$), with a total of 5 particles, as compared to the ERIC[®]+Sofia, Solitaire+Sofia, and ERIC[®]+Sofia+BGC groups that produced 20, 17 and 16 fragments $>200 \mu\text{m}$, respectively. On average, in the size range between 100–200 μm and 50–100 μm , ERIC[®]+Sofia showed a trend to reduce clot fragments as compared with the other 3 treatment strategies; however, these results were not statistically significant ($p > 0.05$). There were no significant differences in particle number between any of the groups for particles with size $<50 \mu\text{m}$. A complete flow restoration after a single pass was observed in all cases except for two experiments in the Solitaire + Sofia group, which required two passes to achieve full recanalization. Without waiting for 4 minutes prior to clot removal, thrombectomy with the ERIC[®] allows shorter time to recanalization as compared to the Solitaire.

Conclusion Based on this preliminary study, it is our conclusion that the techniques of ERIC[®]+BGC, ERIC[®]+Sofia, Solitaire+Sofia, and ERIC[®]+SOFIA+BGC are all similar with regard to clot fragmentation. Combining all particulates in the most dangerous range ($>200 \mu\text{m}$), there was a marginal reduction in the number of distal emboli with the use of ERIC[®] and BGC ($p = 0.064$).

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E-048 FACTORS ASSOCIATED WITH EARLY TRACHEOSTOMY AND PERCUTANEOUS GASTROSTOMY AND THEIR EFFECTS ON HOSPITALIZATION IN HEMORRHAGIC STROKE PATIENTS

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Objective Tracheotomy and percutaneous endoscopic gastrostomy (PEG) are sometimes performed in critically ill hemorrhagic stroke patients in order to avoid complications associated with prolonged intubation and nasogastric feeding. However, there is a paucity of information regarding the optimal timing of these procedures. In this study, we aimed to evaluate the role of early tracheotomy and PEG in hemorrhagic stroke patients.

Methods A series of patients treated at University of Kentucky for hemorrhagic stroke between June 1, 2011 and June 1, 2015 was retrospectively reviewed. Data regarding diagnosis, demographics, comorbidities, treatment, hospital course, and performance of tracheotomy and/or PEG were collected and then analyzed using logistic regression and multiple linear regression.

Results Of 366 hemorrhagic stroke patients, 75 underwent tracheotomy and 86 received PEG. Factors significantly associated with tracheotomy and PEG included patient age ($p < 0.01$), pneumonia present on admission ($p < 0.005$), and subtype of hemorrhagic stroke ($p < 0.05$). Tracheotomy and PEG were not significantly associated with patient survival or development of complications. Earlier PEG placement was correlated significantly with shorter overall hospital stay in survivors ($p < 0.001$), but neither tracheotomy nor PEG was correlated with ICU length of stay.

Conclusions Hemorrhagic stroke is a devastating neurovascular event that requires prompt intervention and vigilant management. Our study identified patient risk factors that may suggest candidacy for tracheotomy and PEG. Additionally, we found that timing of PEG may shape a patient's hospital course. Complication rates related to tracheostomy and PEG in this population were minimal. In conclusion, this retrospective data set supports some benefit to early PEG placement in this population, and justifies the need for further prospective study.

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E-049 EAR ARTERIOVENOUS MALFORMATION MANAGEMENT

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Purpose To determine the efficacy of Ethanol Endovascular Repair of Ear Arteriovenous Malformation (AVMs).

Materials and methods Ten patients (7 female, 3 males; age range 6–39 years; mean age: 22 years) with ear AVMs presented for therapy. Two patients had failed prior embolizations (PVA/coils/nBCA/steroids) and 2 patients had other therapies (laser/excisions/grafting). All presented with a grossly enlarged painful ear, and 5 patients had intermittent bleeding. All patients underwent transcatheter and direct puncture ethanol treatments (86 procedures).

Results All 10 patients were cured of their AVM at long-term follow-up (mean follow-up: 52 months). One patient had transient partial VII nerve palsy. Two patients had minor blisters and ear injuries that healed on the outer tragus.

Conclusions Ethanol endovascular repair of Ear AVMs can achieve cures in this vexing lesion that previously was treated with resection of the ear and with high recurrence rates. This series documents long-term cures of AVMs of the ear and scalp that were not treatable by endovascular approaches as previously documented in the world's literature. Permanent treatment of the auricular AVMs is documented and no recurrence occurred in any patient. Only one article is published (group from Shanghai, China) emulating this technique, that I taught them.

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