clinical baseline and a wider neck independently predict an increased risk of neurological morbidity/mortality.

Disclosures A. Griffin: None. E. Hauck: None.

E-012 PREDICTORS OF ANEURYSM RECURRENCE AFTER ENDOVASCULAR EMBOLIZATION WITH THE SMART COIL SYSTEM
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Background/Objective Endovascular aneurysm embolization is effective and safe. However, the angiographic recurrence continues to be an issue after endovascular embolization. In this study, we aimed to report the rate of recurrence at 1-year follow up angiography and to investigate the predictors of recurrence.

Methods We used the SMART registry to identify subgroup of patients who underwent endovascular embolization with SMART coils and had one year follow up angiography. The primary outcome of this study was angiography recurrence at 1 year. We used stepwise regression analysis to identify the predictors of recurrence.

Results A total of 466 patients were included of whom 78 (16%) had recurrence at 1 year follow up angiography. Mean age was 60 years and 74% were female. 112 (24%) of treated aneurysms were ruptured and 125 (27%) were ≥4 mm in size. On Multivariate analysis, Immediate post procedure Raymond II and III (vs Raymond I), neck size ≥4 (vs.<4), stent-assisted coiling, and age were associated with the risk of recurrence at one-year follow-up.

Conclusion In this study we identified the predictors of aneurysm recurrence after endovascular embolization with SMART coils.


E-013 DELAYED POST-OPERATIVE COIL MIGRATION AFTER SUCCESSFUL BALLOON-ASSISTED COILING OF A BASILAR APICAL ANEURYSM
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A 69-year-old female patient presented with a ruptured small basilar apex aneurysm. Balloon-assisted coil embolization was performed, and the patient remained stable post-operatively. A CT-scan performed 12 days after the procedure showed coil migration from the aneurysm, and repeat angiography confirmed coil migration into the left proximal posterior cerebral artery segment. The patient gave consent for a revision procedure, where an LVIS Jr. stent and 7 micro-coils were placed into the aneurysm to re-secure the aneurysm. The patient suffered no further complications and was discharged home on dual antiplatelet therapy. Modified Rankin Score at 90-days was 1. We review the literature regarding delayed coil migration, and discuss management considerations.

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E-014 COIL EMBOLIZATION RESULTS OF THE RUPTURED PROXIMAL POSTERIOR INFERIOR CEREBELLAR ARTERY ANEURYSM: A SINGLE-CENTER 10 YEARS’ EXPERIENCE
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Objective To report a single-center experience with endovascular treatment of ruptured proximal posterior inferior cerebellar artery (PICA) aneurysms.

Methods Between January 2007 and December 2016, among 1403 patients with aneurysmal subarachnoid hemorrhage, 15 with ruptured proximal PICA aneurysms underwent endovascular embolization at our institution. Aneurysmal obliteration with a single microcatheter was performed in 9 patients. Additional microcatheter or stent-assisted coil embolization was performed in 4 patients and parent artery occlusion in 2 patients.

Results Immediate angiographic results showed 10 complete occlusions (66.7%, 10/15). Five patients showed incomplete occlusion (remnant neck in 4 patients, remnant aneurysm in 1). Of those, 2 patients experienced recurrence and required conversion to microsurgical clipping. The remaining 2 patients remained in relatively stable condition. Procedure-related complications occurred in 3 patients (20%, with thromboembolic complications in 2 patients and intraprocedural rupture in 1). Clinical outcome was excellent: Glasgow Outcome Score 4 or 5 in 12 of 15 patients (80%). There was no rebleeding during follow-up.

Conclusions Ruptured proximal PICA aneurysms may be effectively treated with endovascular coil embolization. A variety of coil embolization techniques are required to obliterate an aneurysm without parent artery occlusion. Given that recurrence is possible, follow-up is required. Surgical clipping can be performed for recurrence with a relatively low risk of complications, because the aneurysm is unruptured. Coil embolization of a proximal PICA aneurysm in the acute phase can be a good treatment modality with good patient outcomes.

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E-015 INFLAMMATION IN MURINE ANEURYSM HEALING: THE ROLE OF CXCL1
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Introduction Cerebral aneurysms affect up to 5% of the U.S. population and can have devastating consequences. Rupture of cerebral aneurysms results in subarachnoid hemorrhage which has a mortality of up to 40%. Current prophylactic treatment options include surgical placement of a clip or use of coils or flow diverters through an endovascular approach. These options carry significant complication risks with functional disability or death occurring in up to 17.5% of patients after surgical clipping and in up to 8.4% after endovascular treatment. A significant drawback of endovascular clipping is that up to 20% of aneurysms can recur and require retreatment due to incomplete thrombus formation and insufficient fibrotic healing. This high rate of recurrence warrants investigation
into the pathophysiology of aneurysm healing and development of more effective therapeutic options. As inflammatory processes appear to be the primary mechanism underlying cerebral aneurysm pathophysiology, it is critical to investigate aneurysm healing in the context of key inflammatory mediators. A more robust understanding of underlying inflammatory processes is crucial to developing novel treatments for complete resolution of unruptured cerebral aneurysms. Using a novel in vitro flow chamber model, we have identified chemokine (C-X-C) motif ligand 1 (CXCL1) as an important mediator in aneurysm pathophysiology. As there is increased expression of CXCL1 at arterial bifurcations and in aneurysms in vitro, we hypothesized that CXCL1 may be a key mediator in aneurysm healing.

Methods Using our murine aneurysm healing model, aneurysms were induced in the right common carotid artery of C57BL/6 mice using elastase. Three weeks later when aneurysm formation was complete, aneurysms were implanted with either poly(lactic-co-glycolic acid)(PLGA)+CXCL1 - coated coils or PLGA only - coated coils. Three weeks after coil implantation, aneurysms were harvested for histological quantification of aneurysm healing. In a subsequent experiment, aneurysms were induced in C57BL/6 mice using the same elastase model. Three weeks after aneurysm induction, all mice underwent aneurysm coiling with PLGA-coated coils. Animals were randomly assigned to receive intraperitoneal injections of either CXCL1 neutralizing antibody or isotype-matched IgG control. Aneurysm tissue was harvested for histological quantification of aneurysm healing.

Results In the first experiment, we found that animals treated with PLGA+CXCL1 - coated coils had significantly less aneurysm healing than those treated with PLGA only - coated coils (21.8% ± 3.87 versus 39.8% ± 8.02, respectively; p = 0.048). In the second experiment, animals treated with CXCL1 neutralizing antibody had significantly increased aneurysm healing compared to those treated with IgG control (63.8% ± 3.69 versus 42.4% ± 3.55, respectively; p = 0.00012).

Conclusion Our findings suggest CXCL1 decreases murine aneurysm healing after coil implantation. Therapeutic intervention with CXCL1 neutralizing antibody appears to increase aneurysm healing after coil implantation.

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Abstract E-016 Figure 1 Left - Hybrid Rheometer. Right - Rheometer Setup for Sample Modulus

Results Via the rheometer, data was collected for luminal wall friction, radial compliance, shear modulus (G*), and elastic modulus (E*). Properties of cadaveric vessels and model materials were statistically compared, and the biomaterials were tuned to closely mimic the mechanical properties of the cadaveric vasculature. The biomaterials were manufactured into flow models. 3D printing manufacturing techniques were used to obtain repeatable anatomical accuracy. Validation of the models by partnered neurointerventionalists is underway to ensure realistic catheter trackability and anatomical accuracy.

Discussion The new biomimetic materials in this study were able to simulate the compliance and mechanical properties of human vasculature more closely than existing silicone, polyurethane, and glass models. The utilization of novel biomimetic materials within this in vitro vascular flow model will allow for more relevant benchtop testing of endovascular devices. These models have the potential to generate more accurate data on device performance and may reduce the need for costly in vivo studies.

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