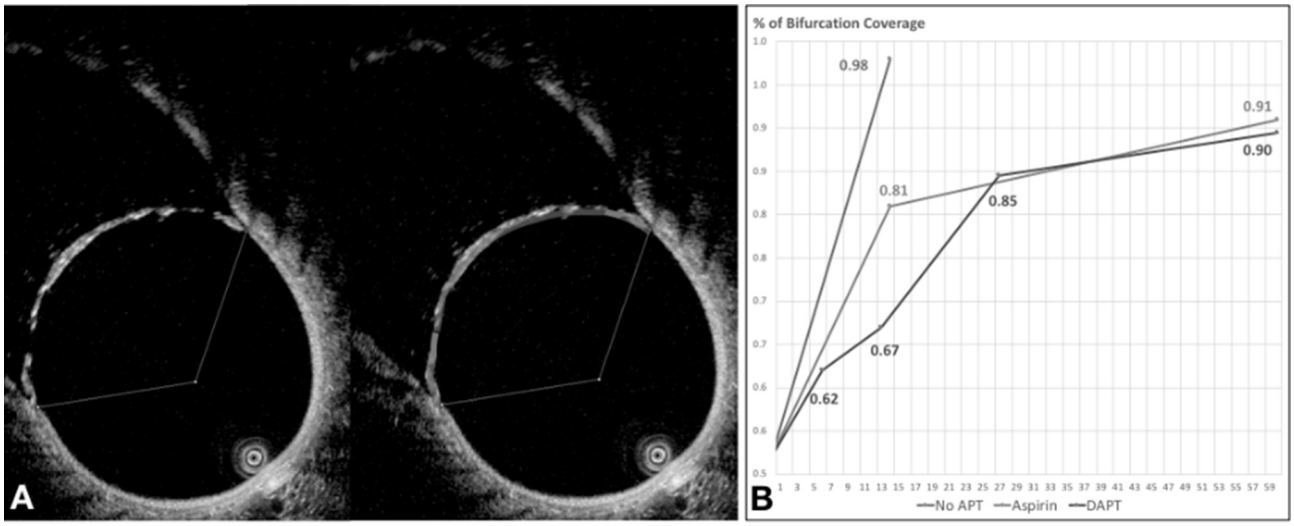

Abstract P-029 Figure 1 An example of HF-OCT cross section analysis. The aneurysm is visible between 9 and 1 o'clock. The covered osmium segment is labelled using the red color; the non-covered ostium segment with green color (**A**). The graph on the right shows the percentage of bifurcation coverage (vertical axes) as a function of time (horizontal axes) for the three different antiplatelet regimens (**B**).

10 µm, HF-OCT can visualize the interaction between the vessel wall and neurovascular devices in great detail.[1, 2]

In this study, we sought to evaluate its use to monitor tissue growth over flow diverter stents (FDS) in an arterial bifurcation rabbit model.

Materials and methods Six FDS (Pipeline Embolization devices) were deployed in 6 animals, covering the iliac bifurcation. Four animals were treated with double antiplatelet therapy (10 mg/kg aspirin and clopidogrel), 1 with aspirin (10 mg/kg) and 1 was not given any treatment.

HF-OCT data were obtained at three different time points per each animal (at implant for all animals then 14 and 60 or 7 and 30 days).

For each ostium section, manual segmentation was performed to quantify the percentage of the ostium surface covered by metal and tissue (figure 1A).

Results Good quality HF-OCT data sets were successfully acquired in all cases. An average of 35 sections (with a spacing between sections of approximately 70 µm) were analyzed per ostium for each time point. Between 0 and 30 days after implant, HF-OCT analysis showed a significantly higher ostium coverage when DAPT was not given. After 30 days, similar growth rates were found in the DAPT and in the aspirin group (Figure 1B). At 60 days a high 90% coverage rate was reached in both groups.

Conclusions HF-OCT enables an accurate visualization of tissue growth over time on FDS struts. HF-OCT imaging can contribute in the pre-clinical evaluation of novel neurovascular devices and, in the near-future, it could potentially contribute to a personalized care, helping the physicians in determining and modulating the ideal antiplatelet regimen for each patient.

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P-030 INTRA-ANEURYSMAL FLOW DIVERSION ASSESSMENT USING PERI-OPERATIVE ADVANCED IMAGING AFTER FLOW DIVERTING STENT (FDS) PLACEMENT: ARE 64 WIRES BETTER THAN 48?

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Background and Purpose Flow diverter devices (FDS) are a true breakthrough in the treatment of neurovascular disease. FDS reduce intra-aneurysmal blood flow inducing progressive thrombosis in a great proportion of treated intracranial aneurysms (IAs). Most of the first generation FDS devices had 48 braided wires, however, next generation devices have 64 wires with better deployment systems. The purpose of this study was to compare intra-aneurysmal flow modifications and flow diversion efficacy between deployments of a newly designed 64-wire (Surpass Evolve; Stryker) and a 48-wire (Pipeline; Medtronic) FDS in various patient-specific silicone aneurysm models.

Methods In-vitro experimental set-up using circulating water system and 4 silicone models with internal carotid aneurysms were used. We assessed the intra-aneurysmal flow modification after stent deployment (Evolve vs. Pipeline) using a flow-analysis digital subtraction angiography (DSA) system (AneurysmFlow, Philips Healthcare). The application uses a 3D rotational angiogram (3DRA) and 60 frames/sec DSA runs before and after device deployment to calculate a Mean Aneurysm Flow Amplitude Ratio (MAFA-R). MAFA-R's are of interest in this experiment as this ratio has previously been shown to be a reliable independent predictor for intracranial aneurysm thrombosis (Pereira et al., 2012). A total of 8 devices were deployed in four different silicone models. For each experimental model, we randomly selected either a Pipeline or Evolve stent to deploy first, followed by removal and deployment of the other stent. Intra-aneurysmal flow calculations were performed before and after each stent deployment and compared using a paired t-test. A VasoCT was performed to confirm suitable stent apposition to the arterial wall.

Results Average MAFA-Ratio values calculated from pre- and post-stent placement were significantly lower after deployment of the 64-wire device (mean= 0.62±0.09) compared to the 48-wire device (0.71±0.06); p=<0.05.
Conclusions Our in-vitro results show that the 64 wire FDS (Evolve) had superior flow diversion effect compared to the 48 wire FDS (Pipeline), suggesting that 64-wires are superior to 48-wire designs for flow diversion efficacy.
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P-031 PRELIMINARY ASSESSMENT OF THE PPODA-QT LLIQUID EMBOLIC IN A RABBIT ELASTASE ANEURYSM MODEL

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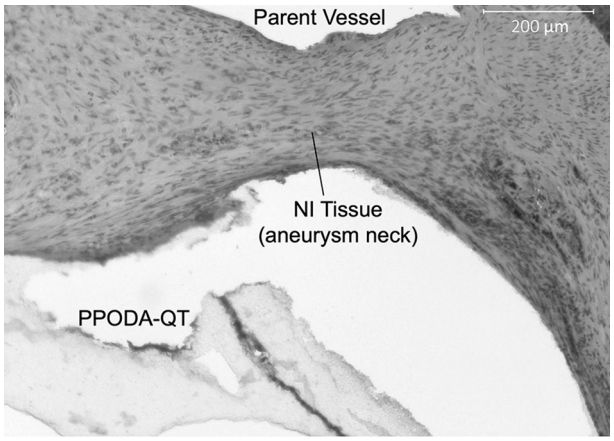
Introduction PPODA-QT is a novel liquid embolic under development for the treatment of cerebral aneurysms. The material is prepared and undergoes gelation in a predictable manner over a pre-set length of time for controllable delivery to the aneurysm with balloon protection. We utilized a rabbit-elastase aneurysm model with histological analysis to evaluate tissue response and biocompatibility following PPODA-QT embolization.
Materials and Methods Experimental elastase-induced aneurysms were created via endovascular technique in New Zealand White Rabbits by incubating 100 U of elastase, mixed 1:1 with and 0.5 M calcium chloride, within the carotid stump for 20 minutes with Fogarty balloon protection. Three weeks after elastase treatment, the aneurysms were embolized using balloon remodeling with a Scepter XC (Microvention) across the aneurysm neck and PPODA-QT was delivered behind the balloon with a Velocity microcatheter (Penumbra). Rabbit control and aneurysm tissues were harvested at acute, 1-month, and 3-month timepoints. All tissues were prepared for histology assessment with Van Gieson and H&E staining protocols.
Results The rabbit-elastase aneurysms developed into small aneurysms (<10 mm dome height) with highly variable neck morphologies and beyond-wide dome-to-neck (*d:n*) ratios. Histological data captured areas of direct device contact with the aneurysm wall and neck, demonstrating elastin reorganization of vessel wall into a smooth muscle layer after 1-month survivals. At the aneurysm neck, a homogenous neointimal (NI) tissue layer (200–300 μm) formed at the PPODA-QT interface, sealing off the parent vessel from the aneurysm dome (figure 1). Results reveal no symptoms of acute inflammation from the elastase incubation and no adverse immune response was evident at 1- and 3-month survival timepoints following PPODA-QT embolization.
Conclusion Following PPODA-QT embolization, NI tissue growth and remodeling was noted with minimal immunological response, indicating that PPODA-QT can be successfully delivered to wider-neck aneurysms and promote aneurysm tissue reorganization and stabilization that facilitates continuous healing at the aneurysm neck. Because experimental aneurysms were uniformly small with inconsistent neck morphology, further testing in larger aneurysm models (i.e. canines) is planned to optimize device delivery and verify healing responses prior to human clinical investigation.



Abstract P-031 Figure 1 Continuous neo-intimal (NI) tissue growth across the neck of a rabbit elastase aneurysm survived 3 months, separating the parent vessel from the PPODA-QT implant

Disclosures T. Becker: 1; C; Brain Aneurysm Foundation Grant-2018. 4; C; Aneuvas Technologies, Inc.. 5; C; Northern Arizona University, Aneuvas Technologies, Inc. **A. Huckleberry:** 1; C; Brain Aneurysm Foundation Grant-2018. **W. Merritt:** 1; C; Brain Aneurysm Foundation Grant-2018. 5; C; Northern Arizona University. **T. Cotter:** 1; C; Brain Aneurysm Foundation Grant-2018. 5; C; McGill University. **C. Settanni:** 1; C; Brain Aneurysm Foundation Grant-2018. 5; C; Northern Arizona University. **A. Ducruet:** 1; C; Brain Aneurysm Foundation Grant-2018. 5; C; Barrow Neurological Institute.

P-032 POST PROCEDURAL LOW DOSE HEPARIN DRIP REDUCES THROMBOTIC EVENTS FOLLOWING PIPELINE EMBOLIZATION, WITHOUT INCREASING HEMORRHAGIC COMPLICATIONS

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Purpose Pipeline embolization devices (PEDs) are associated with inherent thrombotic complications as well as potentially catastrophic spontaneous intraparenchymal hemorrhage. Antiplatelet and anticoagulation therapy must be optimized to reduce thrombotic complications without increasing the incidence of hemorrhage. Post-procedural low dose heparin drip is a prophylactic measure to reduce ischemic stroke risk, with no published data to date reporting efficacy and complications. Here we report the thrombotic and hemorrhagic complication rates of patients receiving post-operative low dose heparin drip, and we compare our results to the published literature rates of patients not receiving such prophylaxis.
Materials and methods We completed a retrospective review of patients who had intracranial aneurysms treated with the Pipeline Embolization Device at Westchester Medical Center. A total of 73 individuals received post-operative low dose heparin for an average of 18 hours. Thrombotic and hemorrhagic complications were identified and reported. These rates were