Abstract P-024 Table 1 Aneurysm Occlusion Rates

Rate of Occlusion	Procedure(n=100)	3-9 Months (n=66)	9-18 Months (n=42)
Grade 0: complete & total aneurysm occlusion	33	40	24
Grade 1: ≥ 90% volumetric aneurysm occlusion	47	13	8
Grade 2: 70-89% volumetric aneurysm occlusion	15	9	7
Grade 3: 50-69% volumetric aneurysm occlusion	3	3	2
Grade 4: 25-49% volumetric aneurysm occlusion	0	1	1
Grade 5: < 25% volumetric aneurysm occlusion	2	0	0
Raymond occlusion Scale			
Complete	45	42	26
Minimal Residual	52	18	11
Residual Aneurysm	3	6	5

Microvention. **C. Schirmer:** 1; C; NIH/NINDS. 6; C; AANS Honoraria, Ownership- NTI. **B. Pukenas:** 1; C; Stryker Neurovascular. **S. Satti:** 2; C; Stryker Neurovascular, Penumbra, Cerenovus, Terumo. 6; C; Medtronic – Proctor. **T. Miller:** None. **D. Gandhi:** 1; C; Stryker Neurovascular.

P-025 OUTCOME STUDY OF PIPELINE EMBOLISATION DEVICE WITH SHIELD TECHNOLOGY IN UNRUPTURED ANEURYSMS

[1]N Kandasamy*, [1]T Booth, [1]J Hart, [2]D Atasoy, [3]Y Shih-hung. *[1]Neuroradiology, King's College hospital, London, UK; [2]Neuroradiology, Karadeniz Technical University Farabi Hospital, Turkey; [3]Neuroradiology, Taipei Medical University-Municipal Wan Fang Hospital, Taiwan*

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Background Pipeline Flex Embolization Device with Shield Technology (Pipeline Shield) has recently been introduced as the third generation of Pipeline flow-diverter devices (FDDs) with a new stent surface modification giving reduced thrombogenicity.

Objective We aimed to evaluate clinical (safety) and radiographic (efficacy) outcomes of the Pipeline Shield.

Methods The 30 day and 1-year mortality and morbidity rates, and the 6 and 18 month radiographic aneurysm occlusion outcomes for procedures performed between March 2016 and January 2018, were reviewed. 3D-TOF-MRA was used for follow up.

Results A total of 44 attempted Pipeline Shield procedures were performed for 41 patients with 44 target aneurysms (total 52 aneurysms treated). 88.5% were inserted in the anterior circulation and 11.5% the posterior circulation. 49/52 (94.2%) aneurysms were saccular, 1/52 (1.9%) was fusiform. One (1.9%) aneurysm was an iatrogenic pseudoaneurysm and one (1.9%) was a dissecting aneurysm. 71% (35/49) of the saccular aneurysms were wide-necked (neck >4 mm), 34.6% (18/52) were large (≥ 10 mm) and 3.8% (2/52) were giant (≥ 25 mm). The mean aneurysm sac maximal diameter was 9.2 mm, and mean neck width was 5.1 mm. The cumulative mortality and morbidity rates were 2.3% and 9.2% at 1 year, respectively. The adequate occlusion rate was 78.8% at 6 months and 90.3% at 18 months.

Conclusions In this pragmatic and independent study, the occlusion rates and safety outcomes were similar to those seen in previously published studies with FDDs and earlier generation PEDs.

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P-026 THE USE OF HIGH-FREQUENCY OPTICAL COHERENCE TOMOGRAPHY FOR FOLLOW-UP IMAGING OF TREATED ANEURYSMS

R King*, M Marsofoi, E Langan, M Shazeeb, G Ughi, C Raskett, A Puri, M Gounis. *Radiology, University of Massachusetts, Worcester, MA*

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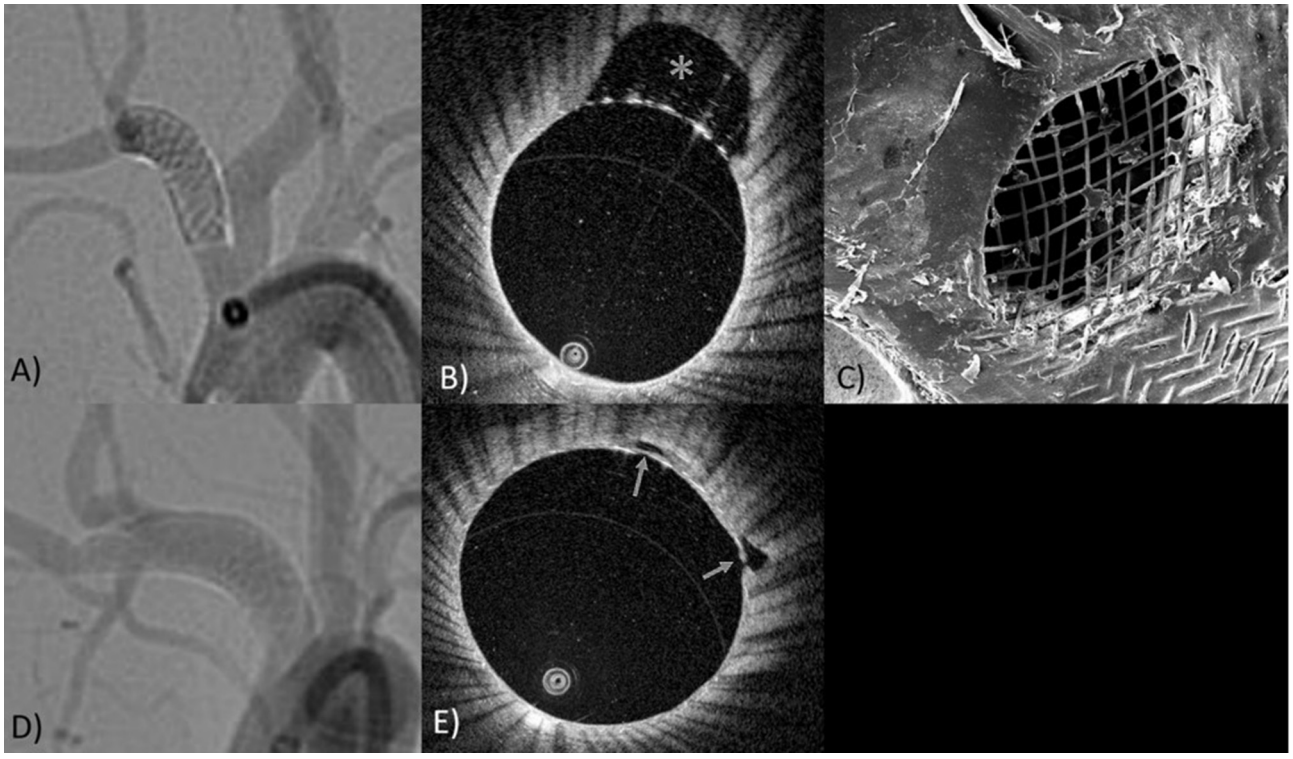
Introduction The use of flow diverters has emerged as an effective treatment of aneurysm. One of the major limitations of flow diverters is the need to put patients on dual anti-platelet therapy (DAPT). The exposure of bare metal struts leads to platelet activation. A method to assess the degree of neointimal tissue ingrowth over the surface of the device could permit patient-specific tailoring of DAPT. Currently, the standard of follow-up for flow diverter patients is digital subtraction angiography (DSA); however, it has been previously reported DSA appearance of complete aneurysm occlusion is not always reliable with continued aneurysm growth.[1] There have been reported cases of very delayed complications after DAPT has been stopped,[2] although rare, such complications can be catastrophic.

High Frequency Optical Coherence Tomography (HF-OCT) is a novel intravascular imaging technique designed for use in



Abstract P-026 Figure 1 Top row: DSA of a 60-day follow up, showing a fully occluded aneurysm (**A**). Corresponding HF-OCT, showing that the aneurysm was in fact not occluded (**B**); the aneurysm remnant is visible between 11 and 2 o'clock (*). SEM of the neck of the aneurysm, confirming the HF-OCT results (**C**) Bottom row: DSA at 15 days follow up of a fully occluded aneurysm (**D**). Corresponding HF-OCT showing evidence that the aneurysm is not occluded (**E**). The two arrows indicate two small remnants at the shoulders of the aneurysm's neck.

cerebrovascular anatomy with a spatial resolution approaching 10 microns. In this study, we sought to compare HF-OCT with state-of-the-art DSA for the in vivo evaluation of complete aneurysm occlusion.

Methods Flow diverters were implanted in 15 rabbits, at least 21 days after a standard elastase aneurysm creation. Six of the rabbits were imaged at 15 days post implant, including both DSA and HF-OCT to assess healing of the aneurysm. The remaining 9 rabbits were allowed to heal for 60 days, at which point they also received HF-OCT. Finally, the rabbits were euthanized, perfused with formalin, and the aneurysms were explanted for histological analysis.

Results Fifteen days following implant, one aneurysm was seen to be fully occluded on DSA, but HF-OCT demonstrated an aneurysm remnant, and the struts remained uncovered (figure 1D-E). At 60 days post-implant, another aneurysm appeared fully healed on DSA, yet HF-OCT demonstrated that the aneurysm remained in communication with the parent artery (figure 1A-B). This observation was later confirmed on SEM (figure C).

Conclusions Preliminary evidence is presented showing that DSA alone is insufficient to confirm complete aneurysm occlusion. HF-OCT may reliably show parent artery remodeling and inform patient-specific decisions regarding duration of DAPT.

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2. *J Neurosurg* 2016;**125**:929–935.

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P-027 CORRELATION OF MULTIMODALITY INTRAOPERATIVE NEUROMONITORING TO PERIOPERATIVE ISCHEMIC EVENTS AND POSTOPERATIVE OUTCOMES DURING 2278 CEREBRAL NEUROENDOVASCULAR PROCEDURES

[1]W Wilent*, [2]S Tjoumakaris, [2]P Jabbour, [2]M Gooch, [2]R Rosenwasser, [3]W Kim, [3]J English, [1]O Belyakina, [1]E Korsgaard, [1]J Cohen, [1]A Sestokas. *[1]SpecialtyCare, Brentwood, TN; [2]Thomas Jefferson University Hospital, Philadelphia, PA; [3]Sutter Health, San Francisco, CA*

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Introduction Intraoperative neuromonitoring (IONM) is being increasingly utilized during cerebral neuroendovascular procedures to improve patient safety, but empirical evidence regarding the diagnostic accuracy and clinical impact of IONM is still needed.

Methods A multi-institutional database of 2278 cerebral neuroendovascular procedures utilizing multimodality IONM was reviewed. All procedures utilized electroencephalography and somatosensory evoked potentials, and a subset also included motor evoked potentials (MEPs). IONM alerts were categorized as either a significant attenuation or complete loss of response. Retrospective review was used to identify perioperative arterial complications associated with IONM changes which were subcategorized as due to rupture, embolus, instrumentation, or vasospasm. Odds Ratios (OR) for new postoperative deficits were calculated as a function of the type of complication, magnitude of IONM signal change, and signal status at closure. Diagnostic accuracy was measured using sensitivity, specificity, and positive and negative likelihood ratios (PLRs and NLRs).

Results Overall, IONM was highly accurate in diagnosing evolving neurological injury for either the MEP or non-MEP cohorts (table 1). Relative to cases with no alerts, the odds of