Fisher exact test and in multivariate analysis using multiple logistic regression with bidirectional elimination based on the Akaike information criterion. In both univariate and multivariate analyses, statistical significance was corrected for multiple comparisons using the Benjamini-Hochberg method with a prespecified false discovery rate of 0.05.

Results Complications occurred in 6.5% of procedures, including 1.9% neurological complications and 4.8% non-neurological complications. Permanent deficits occurred in only 0.2% of cases, corresponding to a single thromboembolic event. Overall, 0.5% of procedures resulted in major complications while 6.0% resulted in minor complications. Access site complications occurred in 0.7% of procedures and technical complications occurred in 0.3% of procedures. History of hypertension, history of ischemic stroke, and female sex were associated with an increased risk of complications, while femoral artery access was associated with a decreased risk of complications.

Conclusions Pediatric cerebral angiography has a low rate of major or permanent complications. Children with history of hypertension, history of ischemic stroke, or female sex are at higher risk of complications, while use of femoral access carries lower risk of complications.

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E-146

THE VALUE OF LONG-TERM ANGIOGRAPHIC FOLLOW-UP FOLLOWING PIPELINE EMBOLIZATION OF INTRACRANIAL ANEURYSMS

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Introduction/Purpose Flow diversion of intracranial aneurysms with the Pipeline embolization device is commonly performed, but the value of long-term angiographic follow-up has not been rigorously evaluated. Here, we examine the prevalence of actionable findings of aneurysm recurrence and development of in-stent stenosis in a cohort of patients that underwent long-term angiographic follow-up at multiple timepoints. **Materials and Methods** Angiographic data from eligible patients was retrospectively assessed for aneurysm occlusion, in-stent stenosis, and aneurysm regrowth or recurrence. Aneurysm occlusion was determined using the O'Kelly-Marotta scale. Patients were included in this study if they underwent angiographic imaging at 6 months post-treatment and at least one later timepoint. Pertinent findings of aneurysm occlusion status and presence of in-stent stenosis at final follow-up were stratified based on findings on 6 month angiography.

Results 100% (132/132) of aneurysms occluded at 6 months remained occluded at final follow-up. Of those not occluded at 6 months, 85.7% (6/7) with an entry remnant, 56.3% (27/48) with subtotal filling, and 25% (6/24) with total filling at 6 months were completely occluded at final follow-up. 1.3% (2/149) of Pipeline embolization device constructs demonstrating no in-stent stenosis at 6 months developed in-stent stenosis on final angiography, while 44.4% (8/18) of PED constructs demonstrating in-stent stenosis at 6 months had

Abstract E-146 Figure 1 Preoperative angiogram showing a 9.1 mm saccular aneurysm at the petrous-cavernous junction of the left internal carotid artery (a), 6-month post-treatment angiography showing an entry remnant at the site of the treated aneurysm (b), 20-month post-treatment 3D rotation angiography showing a 3.4 mm saccular regrowth of the treated aneurysm (c), 3D rotation angiography after a second Pipeline embolization device treatment showing complete aneurysm occlusion (d).

resolution of stenosis on final angiography. No aneurysms that were completely occluded at 6 months recurred at later angiography, but one aneurysm enlarged from an entry remnant at 6 months to demonstrate subtotal filling at later follow-up (figure 1).

Conclusion Amongst patients that undergo treatment of intracranial aneurysms with Pipeline embolization device, the value of long-term angiography in patients demonstrating complete aneurysm occlusion and no in-stent stenosis on 6-month post-treatment angiography is low.

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Late-breaking oral abstracts

LB-001

FIRST IN-HUMAN TREATMENT OF COMMUNICATING HYDROCEPHALUS USING THE CEREVASC ESHUNT™ MINIATURE BIOMIMETIC ENDOVASCULAR CSF SHUNT

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Surgical ventriculoperitoneal shunting remains standard treatment for communicating hydrocephalus, despite significant infection and revision rates. A new minimally-invasive endovascular cerebrospinal fluid shunt has been developed (Cerevasc eShunt™) to mimic arachnoid granulation function. This implant is intended to be deployed via femoral transvenous approach across the inferior petrosal sinus dura mater into the cerebellopontine angle cistern. We hereby present the first

patient to be treated using this approach. An 84-year-old woman with intractable hydrocephalus following subarachnoid hemorrhage underwent an external ventricular drain clamping which was not tolerated owing to intracranial pressure (ICP) reaching 44cmH₂O. On the following day, her drain was clamped eight hours prior to undergoing successful endovascular deployment of the eShunt device with post-implant CT head showing no hemorrhage. Within 90 mins of eShunt insertion, the patient's ICP decreased from 38 to <20 cmH₂O to followed by subsequent resolution of ventriculomegaly. This is the first patient treated for communicating hydrocephalus using a novel endovascular CSF shunt without the need for a burr hole, brain penetration or multiple skin incisions. This novel and unique percutaneous transluminal access to the central nervous system ushers a new pathway for non-invasive treatment of hydrocephalus and potential for percutaneous access to the central nervous system for intervention against neurological disorders.

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LB-002 OPTHALMIC ARTERY ANGIOPLASTY FOR AGE RELATED MACULAR DEGENERATION

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Background Age-related macular degeneration (AMD) is the leading cause of irreversible blindness among the elderly in the developed world, for which there is currently no available treatment. Compromised ocular microcirculation due to aging and vascular disease contribute to retinal dysfunction and vision loss; decreased choroidal perfusion is evident in eyes with dry AMD. In an effort to evaluate whether or not the the ophthalmic artery (OA) is a contributor to decreased retinal perfusion in eyes with AMD, a study was conducted utilizing a 7T MRI and a custom built 32 channel head receive array coil with a birdcage transmit coil to non-invasively capture hemodynamic data of both arteries. The study demonstrated a statistically significant decrease in both lumen diameter ($p=0.006$) and volumetric flow rates ($p=0.041$), and an increase in resistive index ($p<0.001$), which measures dynamic flow properties, in the OA of AMD patients as compared to age matched controls without AMD. These findings indicate the changes in or around the OA, may be contributing to decreased retinal perfusion in AMD patients, and present a potential treatment target in a patient population without therapeutic options.

Methods Five patients who presented late-stage AMD as evidenced by the presence of geographic atrophy or stabilized history of choroidal neovascularization, best corrected visual acuity (BCVA) of 20/400 or worse, in combination with processed intraarterial cone beam-volume CT images regarding the precise OA origin and the relationship with an atheroma plaque nearby or in the artery were selected. The eye with the worst visual acuity was chosen for treatment.

Results After a difficult cannulation of the OA due to its narrowing, balloon angioplasty was successfully performed in all of the five cases. Subjective patient reports indicated all

patients perceived a benefit following the procedure; however, improved postoperative visual acuity did not confirm that perceived benefit for one of the patients. Mean preoperative BCVA was 20/710 and improved to 20/383 at 1 week postoperative, representing a mean gain of nearly 3 lines, remaining stable through month six.

Conclusion Our preliminary experience in a small cohort of patients suggest that OA angioplasty may be performed safely and there is subjective evidence of efficacy. The OA is a viable target to increase blood flow to the eye, restore retinal perfusion, and perhaps disrupt the disease process of AMD. To proceed with a randomized controlled trial, devices specific to this application should be developed.

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LB-003 TRANSRADIAL VERSUS TRANSFEMORAL ARTERIAL APPROACH FOR CEREBRAL ANGIOGRAPHY AND THE FREQUENCY OF SILENT EMBOLI ON DIFFUSION-WEIGHTED MRI

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Introduction The radial artery approach has become popular as 'radial-first' strategy for arterial access in neuroangiography and neurointerventions.¹ Recent studies have shown that transradial arterial access (TRA) for cerebral angiography has been associated with reduced access site complication rates and improved patient satisfaction compared with transfemoral access (TFA).²⁻³ In spite of the increased adoption of the TRA technique, as well as proven decreased complication rates in the cardiology literature compared to TFA, the frequency of MRI diffusion-weighted imaging changes post cerebral angiography has not been described. It is known that diagnostic angiography, either TRA or TFA, of the cerebral vessels harbours a small but definite risk of neurological complications, such as a new focal neurological deficit,⁴⁻⁵ ranging from 0.55% to 3.2%.⁶ The goal of this study was to evaluate the presence of abnormal diffusion restriction foci, which represents silent embolic events (SEE) during digital subtraction angiography (DSA) and correlated their presence and frequency with TRA or TFA.

Methods We analysed 120 consecutive adult diagnostic cerebral angiograms performed over 6 months, from January 2021 and concluding in June 2021, at a single tertiary centre, performed by a single operator. Access site was randomised aiming for approximately 50% TRA and 50% TFA by the end of the allocation period.

Results Of the 120 consecutive diagnostic cerebral angiograms, 58 (49%) were performed via TRA, and 62 (51%) were performed via TFA. One case was performed via right ulnar artery access (which we considered as TRA for the purpose of statistical analysis). Of the TRA cerebral angiograms, 8 demonstrated DWI changes (silent embolic events). Of the TFA procedures, one showed abnormal diffusion restriction. Two cases were converted from TRA to TFA, one due to a radial loop and one due to an incidental right aberrant subclavian artery. No vascular access site complications were observed. The mean number of vessels catheterised in the TRA group was