Introduction Refinement of intracranial aneurysm rupture risk estimations may improve patient selection for preventive treatment. Dynamical scans may highlight reduced stability of the vessel wall.

Aim of Study The magnitude of pulsations is unknown, but are thought to be smaller than the CT resolution. Noise and artefacts impede reliable measurement. The aim of this study is to quantify the cardiac cycle-related pulsations of intracranial vessels and aneurysms, and to compare patterns of different cardiac cycles.

Methods 4D CTA scans (Aquilion One PRISM Edition, Canon Medical Systems Corporation, Otawara, Japan) of three consecutive heartbeats were obtained in 15 patients harboring an intracranial aneurysm (rotation time= 0.275s, tube current= 340 mA, tube voltage= 100kV). Reconstructions of every 5% of the R-R interval were obtained using retrospective cardiac gating. A reference mesh was created per subject to compare segmentations of different cardiac phases. A periodogram was created for the mean pulsatile pattern of a vessel and an aneurysm segment.

Results 15 patients with 19 unruptured and untreated aneurysms with a mean diameter of 5.8 ± 6.3 mm (mean $\pm$ std) were scanned, resulting in a mean CT DIvol of 76 [64 94] mGy (mean [min max]). Frequency analysis revealed an artefact with a frequency similar to the gantry rotation frequency. Furthermore, pulsations with frequencies similar to the heart rate were found in the vessel and aneurysm segments.

Conclusions The role of inter-cardiac cycles comparison and frequency analysis is essential for the differentiation between real pulsations and pulsations induced by noise or artefacts on dynamic CTA.

Disclosure Nothing to disclose

EP19

PIPELINE SHIELD FOR THE TREATMENT OF UNRUPTURED INTRACRANIAL ANEURYSMS: LONG-TERM FOLLOW-UP OUTCOMES IN A CASE SERIES OF 67 ANEURYSMS

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10.1136/neurintsurg-2021-ESMINT.19

Introduction The Pipeline Flex embolisation device with Shield Technology (Pipeline Shield) is a flow diverter covalently bonded with a polymer proven to reduce thrombogenicity.¹ Its short- and mid-term safety and efficacy have been established by multiple centres.^{1 2} To date, there is no published data regarding its performance beyond 12 months post-procedure.

Objectives To detail the 2-year follow-up outcomes of 67 aneurysms treated with Pipeline Shield in 60 patients.

Aims To discuss the long-term safety and efficacy of Pipeline Shield for unruptured aneurysms.

Methods This prospective, single-arm study assessed 67 aneurysms in 60 patients treated over a 32-month time period from the time of procedure to 2-years post-procedure between October 2017 and May 2020. Data collected included patient demographics, aneurysm features, and intra/periprocedural and 6-month/2-year post-procedural aneurysm appearances and complications.

Results The mean age of the cohort was 58. The majority of aneurysms were small (24/67) or medium (29/67) with a mean aspect ratio of 1.25 and dome to neck ratio of 1.54.

62 were in the anterior circulation and 5 were posteriorly located. 49 were flow diverted only. The remainder, including all aneurysms larger than 12 mm, were also coiled. All patients were placed on a dual antiplatelet therapy post-procedure regimen. There were no intraprocedural complications and 2 major and 2 minor periprocedural strokes. Satisfactory occlusion was achieved in 87.7% (49/60) of patients at 6 months and 92% (25/27) at 2 years.

Conclusions Pipeline Shield is safe and efficacious at 2-years follow-up in unruptured aneurysms.

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Disclosure Dr A Sastry is a consultant for Medtronic.

EP20

SAFETY AND PERFORMANCE OF THE PENUMBRA SMART COIL SYSTEM FOR PATIENTS WITH POSTERIOR CIRCULATION ANEURYSM

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10.1136/neurintsurg-2021-ESMINT.20

Introduction Treatment of posterior circulation aneurysm has high rates of morbidity and mortality.

Aim of the Study Evaluate the safety and performance of the SMART COIL System through 1-year follow-up in posterior circulation aneurysm patients enrolled in the SMART registry.

Methods This study is a subset analysis of the SMART registry, a prospective, multicenter registry study of 995 patients (905 with aneurysm) treated with SMART COIL, Penumbra COIL 400, or Penumbra Occlusion Device as per the indications.

Results Posterior circulation aneurysm was present in 19.8% (179/905) of the enrolled patients with aneurysm. Median age of those patients was 62 years, and 78.8% (141/179) of patients were female. The posterior circulation aneurysm was ruptured in 38.5% (69/179) of patients and wide necked (dome-to-neck ratio <2 or neck width $\geq$ 4 mm) in 72.9% (121/179) of patients. Median packing density of the coiled aneurysms was 28.0% (IQR 21.4%–35.2%).

Raymond Class I or II was achieved in 81.5% (145/178) of posterior circulation aneurysms at immediate post procedure and 88.3% (113/128) at 1-year follow-up. The retreatment rate through 1 year was 6.1% (8/132). The procedural device-related serious adverse event rate was 1.7% (3/179). A modified Rankin Scale score (mRS) of 0 to 2 was observed in 74.7% (71/95) of patients at 1-year follow-up; from admission to 1-year follow-up, mRS improved or was stable in 75.3% (55/73) of patients.

Conclusions This subset analysis suggests that the SMART COIL System achieves adequate embolization in posterior circulation aneurysms, with a low retreatment rate over 1 year.

Disclosure Clemens Schirmer: Research support: Penumbra; Ownership: NTI. Alejandro Spiotta: Consulting: Stryker, Penumbra, Terumo; Research support: Stryker, Penumbra,

Medtronic. Brad Bohnstedt, Richard Bellon, Harris Hawk: Nothing to disclose.

EP21

HOW FAR CAN WE GO? WEB TECHNOLOGY FOR THE TREATMENT OF SIDEWALL INTRACRANIAL ANEURYSMS: INITIAL SINGLE CENTER EXPERIENCE

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10.1136/neurintsurg-2021-ESMINT.21

Materials and Methods Patients were carefully selected. IRB approved. Clinical, anatomical, angiographical, and technical considerations were analyzed. Procedure-related complications, procedural time, antiplatelet therapy requirements. Web Occlusion Scale (WOS) was used for the Follow-up.

Results From August 2017 and March 2021 a total of 14 wide-necked, sidewall, IA were selected for WEB treatment. Aneurysm mean size 5.3 mm in width and 5.8 in height.

Aneurysm Location: ICA 8 cases (five PComA, two Carotid-ophthalmic segment, one AChOA segment), Superior Cerebellar Artery SCA in 5 patients (35%), and one impressive case in posterior circulation associated with a basilar fenestration next to VBJ. Eight cases were unruptured (57%), and six cases with a history of SAH-acute setting. DAPT was used pre-operatively in all elective cases but no patient remained under antiplatelets after the procedure. Technical success of 100%. Mean procedure time: 24 min. None related procedure complications were recorded. Immediately angiographic occlusion was evidenced in 9 cases. Radiological Follow up (ranging 1 – 26 months) available in 9/14 showed a WOS adequate occlusion in all cases.

Conclusion In our early experience using WEB device to treat different conditions than bifurcation intracranial aneurysms, the results showed that the endosaccular approach was feasible in highly selected patients, the safety profile in agreement with previous bifurcation experiences, and very effective to treat challenge cases with a high probability of recurrence or therapeutic failure.

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Disclosure Boris Pabon proctorship con MEDTRONIC, Microvention Consultant MIVI

EP22

THE WALLABY AVENIR COIL SYSTEM: INITIAL EXPERIENCE WITH USE OF AVENIR COILS FOR TREATMENT OF INTRACRANIAL ANEURYSMS

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10.1136/neurintsurg-2021-ESMINT.22

Introduction The Wallaby Avenir coil system is a novel generation of platinum embolic coil system indicated for endovascular embolization of intracranial aneurysms and other

neurovascular abnormalities. The coils come in framing, filling and finishing types in different sizes both in helical and three dimensional shapes. The unique feature of this coil is that it does not need a detacher and can be mechanically detached with fingers once optimal coil position is achieved. This is a new move in technology that has not been recommended for reliable detachment in other pre-existing coil embolization systems.

Aims To assess Wallaby Avenir coil embolization system detachment reliability, summarise intra-procedural outcomes in the treatment of intracranial aneurysms following its introduction in a tertiary centre.

Methods This prospective study reviewed total of 11 patients with 10 intracranial aneurysms and 1 carotico-cavernous fistula between January 2021 and May 2021. 7 acute and 4 elective aneurysms were treated. All patients with intracranial aneurysms treated with Avenir coil system were included in the study.

Results The average age of the cohort was 59.5 years. 85.8% (67/78) coils Avenir coils detached reliably. Good Raymond-Roy occlusion was achieved in 91% (10/11) aneurysms in the immediate post procedural run. There was no mortality or neurological deterioration in the series. There was no intra-procedural aneurysmal rupture from Avenir coils.

Conclusions The Wallaby Avenir coil system have excellent intraprocedural safety profile with no procedure related mortality or morbidity and good postprocedural aneurysm occlusion rates.

Disclosure Nothing to disclose

Brain AVM/AVF, spinal vascular malformations

EP23*

ENDOVASCULAR TREATMENT OF ANTERIOR CRANIAL FOSSA FISTULAS: THE SIGNIFICANCE OF RETROGRADE TRANSVENOUS APPROACH

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10.1136/neurintsurg-2021-ESMINT.23

Materials and Methods Between September 2016 and March 2019 a retrospective review was performed. A total of 9 Patients with DAVF of the anterior cranial fossa managed with embolization through the venous side with Onyx/PHIL were selected.

Results Nine patients were included in this study, patients were between 14 and 79 years old (mean 45.6). Six primarily presented with intracranial hemorrhage. All fistulas were fed by the bilateral ethmoidal arteries arising from the ophthalmic artery and by the anterior branch of the middle meningeal artery. One case with history of type D CCF. The abnormal shunt drained into the superior sagittal sinus with the interposition of the cortical veins in all nine patients. All of the cases had high-grade Cognard classifications (III-IV). 4 (44%) patients had been treated via transarterial embolization (TAE) via the AEA of the OA. All cases were treated via transvenous embolization (TVE), 8 of 9 (88%) were treated with the trans-SSS approach. A complete angiographic cure was achieved in all patients, without postprocedural complications. There were nearly no symptoms among the patients during follow-up.