related hemorrhage in the FD group (3.8%) and one in the coil group (1.9%), both resulted in moderate morbidity (mRS 3 and 2, respectively), without mortality occurring.

Conclusion Flow diverters demonstrated a nearly twice higher rate of definitive angiographic cure vs coils, but the rate of clinically acceptable occlusion was similar. The complications and morbidity rates were equally very low. We suggest that the aneurysm and parent vessel anatomy should be the main factors when choosing the modality for treating SHA aneurysm.

Disclosures A. Gorbatykh: None. **K. Orlov:** None.

E-184 NON-DESTRUCTIVE RHEOLOGY TECHNIQUE FOR MATERIAL CHARACTERIZATION OF CADAVERIC TISSUE

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10.1136/neurintsurg-2020-SNIS.215

Introduction/Purpose Although current vessel-training models cast from human vasculature are anatomically accurate, the materials used (i.e. silicones and glass) do not accurately simulate the vascular compliance (modulus) and wall friction effects (lubricity) seen in human vasculature. Deriving mechanical properties from samples historically results in destroying the samples being tested. Mechanical testing often delaminated tissue layers, ruptures the endotheliatl layer, or tears tissue completely. Mechanical characterization using dynamic loading (hybrid rheometer (DHR-2, TA Instruments) can provide reliable and repeatable material property data without damaging the tissue. Therefore, the same tissue samples can also undergo histological analysis of microstructures and results can be directly correlated to the mechanical characterization data. This ultimately reduces the samples needed to obtain statistically significant results.

Materials and Methods Non-destructive mechanical testing was performed on 8 mm diameter tissue samples (figure 1A). The following non-destructive tests were completed on the same samples: dynamic compressive modulus, shear modulus, tensile modulus, and poisson's ratio (figure 1B). Next, these samples were fixed in formalin, embedded, cross-sectioned, stained with H&E, and scanned with a microscope scanner (resolutions from 1x to 40x magnification). The histological images were compared to control tissue samples taken from the same tissue (not mechanically tested, but histologically stained). Properties of cadaveric vessels were compared and validated with histology. All layers of the vasculature were scanned for damage.

Results Gross inspection of the tissues showed no apparent damage, and the control and mechanically tested samples appeared identical. No apparent tissue damage was seen from the histologically prepped tissue slides (figure 1C and D). The endothelial layer remained intact on all tested and control samples. No delamination of tissue layers was observed and no histology artifacts were found on the tissue slides.

Conclusion Dynamic, non-destructive mechanical testing using rheological testing techniques is an effective approach to analyzing delicate and rare tissue samples without causing permanent damage. In the case of human vasculature, there is an opportunity to understand the anatomical and mechanical properties of diseased, normal, or calcified regions of tissue, even from the same sample. Reducing the need for repetitive testing on multiple human and animal tissue samples. Correlating mechanical and histological tissue properties directly can improve the creation of more accurate vessel analogs and in-vitro vessel models, ultimately improving device testing outcomes and reducing the need for biological samples.

Disclosures N. Nau: None.

E-185 MR VESSEL WALL IMAGING IN THE DIAGNOSIS OF OCCULT RUPTURED BLISTER INTRACRANIAL ANEURYSMS

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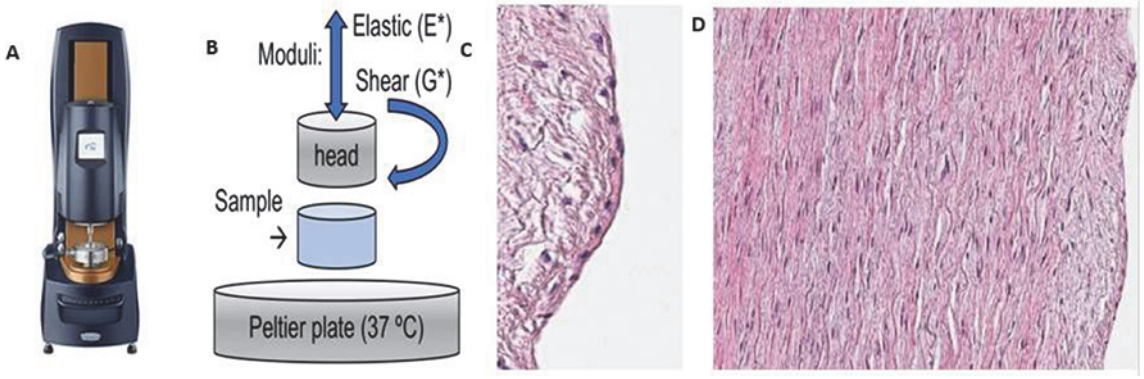
10.1136/neurintsurg-2020-SNIS.216

Purpose Blister intracranial aneurysms are a rare etiology of subarachnoid hemorrhage (SAH) accompanied by high morbidity and mortality rates. Digital subtraction angiography (DSA) and CT angiography (CTA) serve as the main imaging techniques for diagnosing the cause of SAH, yet blister aneurysms can remain occult on DSA or CTA imaging due to their small size, broad based morphology, and early transient thrombosis.



Abstract E-184 Figure 1 A-Hybrid rheometer: B-Rheometer setup for mechanical testing F C-undamaged vessel endothelial layer (40X) D-Histological slide of an undamaged human vessel

In this case series of SAH patients that were diagnosed with ruptured blister aneurysms, we investigated the role of high-resolution (HR)-MRI Vessel Wall Imaging (VWI) in identifying culprit, ruptured aneurysm diagnoses.

Methods and Materials We performed an IRB-approved retrospective review of patients diagnosed with SAH from 2010–2019 at our institution. We studied patient demographics, presentations, aneurysm size/locations, initial and follow-up imaging including CT, CTA/MRA, DSA, and MR VWII studies.

Results Seven patients (1 Male: 6 Female, mean age: 52) with ruptured blister aneurysms were identified. Median of Hunt-Hess grade (range: 1–4) and Fisher grade (range: 2–4) at presentation were 1 and 3 respectively. Blister aneurysm were small 1–3 mm in mean size and broad based neck morphology in the anterior circulation. All but 2 of them were located in non-branching sites. Initial CTA was diagnostic for a ruptured blister aneurysm in 3/7 (43%), confirmed with DSA. In the remaining 4/7 cases CTA was negative, and DSA identified two of these occult ruptured blister aneurysm initially and two subsequently on 1 week follow-up DSA. HR-MR VWI was performed in 3/4 patients 1–3 days after presentation and revealed mild to moderate focal enhancement and/or T1 hyperintensity of the small aneurysm wall corresponding to the blister aneurysm sites confirmed by initial or follow-up DSA.

Conclusion HR-MR VWI can provide adjunctive diagnostic information for the identification of occult ruptured blister aneurysm in SAH patients, when combined with conventional imaging studies such as CTA and DSA. HR-MR VWI may assist in accelerate the time to definite diagnosis in cases with negative initial CTA or DSA findings.

Disclosures Y. Moazeni: None. **R. Abdalla:** None. **M. Sukumaran:** None. **D. Cantrell:** None. **A. Shaibani:** None. **M. Hurley:** None. **B. Jahromi:** None. **M. Potts:** None. **S. Ansari:** None.

E-186 THE WOVEN ENDOBRIDGE DEVICE FOR RUPTURED INTRACRANIAL ANEURYSMS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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10.1136/neurintsurg-2020-SNIS.217

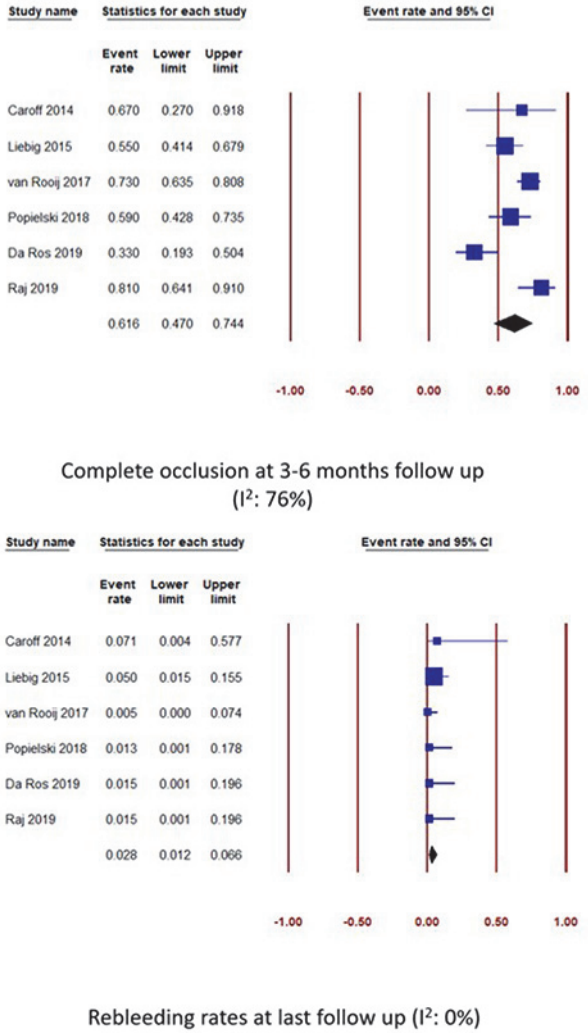
Background Compared to stent-assisted coiling the Woven EndoBridge (WEB) device offers the advantage of treatment of wide-necked aneurysms without antiplatelet medications. However, the safety and efficacy of WEB is yet to be fully defined in the setting of aneurysmal subarachnoid hemorrhage (aSAH), given concerns regarding the delayed nature of aneurysm thrombosis.

Methods The search protocol was developed a priori according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A literature search using the OVID Medline, Embase, Web of Science, and Cochrane Library databases from inception to February 2020 was performed using relevant key words to identify cases of aSAH that were treated with WEB. The primary outcome measure was radiographic complete occlusion rates. Secondary outcomes included rebleeding and complications rates. All pooled event rates were calculated using random effect model.

Results Six articles, all of which were observational case series, representing 261 ruptured aneurysms were included for analysis (average follow up time was 4 months). Most of these aneurysms were in the anterior circulation (>60%). The likelihood of a complete radiographic occlusion following WEB for ruptured aneurysms was 66.6% (95% CI 47–74%). Rebleeding rates were 2.8% (95% CI 1–6%). The pooled event rate for complications (procedural aneurysm rupture, thromboembolic, and device protrusion in the parent artery) across five studies was 17.9% (95% CI 9–32%). Overall retreatment rates were 10% (95% CI 4–22%) and the need for early or delayed stent placement was 5% (95% CI 1–12%). There was no significant heterogeneity between studies in rebleeding and stent placement outcomes (I^2<25%).

Conclusion The WEB device in aSAH appears to provide similar protection against rebleeding and retreatment rates that are comparable to traditional approaches; however, there is a higher rate of incomplete radiographic occlusion and operative complications. Long-term prospective studies are needed to fully delineate the role of WEB embolization in aSAH.

Disclosures N. Alotaibi: None. **P. Harker:** None. **F. Robertson:** None. **J. Vranic:** None. **M. Koch:** None. **C. Stapleton:** None. **T. Leslie-Mazwi:** None. **A. Patel:** None.



Abstract E-186 Figure 1