LONG-TERM OUTCOMES OF MEDICAL, ENDOVASCULAR, AND MICROSURGICAL MANAGEMENT OF INFECTIOUS INTRACRANIAL ANEURYSMS

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Background Infectious intracranial aneurysms (IIAs) or mycotic aneurysms are rare neurological manifestations of infective endocarditis or systemic infections. To date, data on long-term outcomes of IIAs remain limited, and there is no guidelines or standard protocols for management. We explored long-term clinical outcomes in patients treated for IIA using medical, endovascular and microsurgical approaches.

Methods We retrospectively reviewed patients treated for IIAs at Emory University Hospitals or Grady memorial hospital between May 2015 and May 2020 using diagnosis code and reviewing records of patients with infective endocarditis and concurrent intracranial hemorrhage. Patient charts, imaging data, procedure notes and pathological reports were reviewed including the different treatment approaches including medical, endovascular and microsurgical management. Outcome measures included aneurysm progression or re-rupture, 90-day mRS scores, and mortality. Patients were followed up to 5 years from diagnosis.

Results Among 1714 patients with infective endocarditis, 322 (19%) developed intracranial hemorrhage of which 17 patients were found to have IIA. In patients with IE, presence of IIA was associated with higher odds of disposition to hospice or death compared to those without IIA (OR = 6.9, p < 0.05). In addition, 7 patients with systemic infections were found to have IIA during the same period. Our cohort included 24 patients with 38 IIAs of which 67% presented with rupture and the remaining were incidental on surveillance imaging. The majority of aneurysms involved the middle cerebral artery (74%), and multiple aneurysms were noted in 30% of subjects. A trial of antibiotics was used 82% of cases whereas primary open or endovascular intervention was used in 18% of patients. Treatment failure defined as progression of aneurysm, rupture or re-rupture was noted in 48% of patients managed medically, and required endovascular or open microsurgical salvage. Treatment failure occurred within 2 weeks of initiation of antibiotics in 50% of cases and independently predicted worse mRS scores and mortality at 90 days. The 2-year survival in this cohort was 70%.

Conclusions Patients with IIA are at higher risk of neurological decline and mortality in the event of rupture. Patients treated with antibiotics have higher risk of treatment failure requiring salvage surgical or endovascular intervention. Medical treatment failure occurred mostly within 2 weeks of onset and had negative prognostic value emphasizing the need for close follow-up and early surgical or endovascular management if possible.

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FIRST US MULTICENTER EXPERIENCE USING THE PIPELINE FLEX EMBOLIZATION DEVICE WITH SHIELD TECHNOLOGY FOR TREATMENT OF INTRACRANIAL ANEURYSMS – PERIPROCEDURAL OUTCOMES AND EARLY SAFETY PROFILE

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Introduction/Purpose Since becoming available in 2007, flow diverters introduced the principle of endovascular reconstruction of the parent artery and exclusion of the aneurysm from the blood circulation, which has revolutionized intracranial aneurysm treatment. Despite the overall positive results, a major concern of flow diverter implantation is possible ischemic and thromboembolic complications. To
reduce material thrombogenicity, the PED Flex device underwent surface modification with covalently bonded phosphorylcholine to the surface of the implant, so called Shield Technology™. This technology has been shown to reduce thrombogenicity and promote endothelialization with earlier and thicker neointima formation but less hyperplasia.

**Materials and Methods** Prospective maintained neurointerventional databases at 7 high-volume U.S. medical centers were retrospectively reviewed between April 2021 (corresponding with the FDA approval of the PED Shield) and October 2021. Additionally, compassionate use cases between 2016 and 2020 were also included. All patients who underwent placement of a PED Shield for treatment of a ruptured or unruptured intracranial aneurysm were identified. Patients who underwent re-treatment of an intracranial aneurysm due to failed primary treatment method were also included. Patient demographics, information on aneurysm size, morphology, and location as well as procedural data including device(s) used, adjunctive coiling and/or balloon angioplasty performed, intra-procedural complications, patient early angiographic and clinical outcomes were collected.

**Results** One hundred thirty-eight patients were included (111 women) with 147 aneurysms. Eight aneurysms were ruptured. The patient’s mean age was 58 years. Most aneurysms were located along the ICA (n=120), specifically along the ophthalmic segment (n=53), wide-necked (n=121) and saccular in shape (n=110). Mean aneurysm size was 4.3 mm (1.5 – 22 mm). PED Shield deployment was technically successful in 136 cases (98.6%). Balloon angioplasty was performed in 22 cases (15.9%). Aneurysm stasis after device deployment was seen in 86 aneurysms (58.5%). No major ischemic stroke or neurological death occurred. Transient ischemic attack was seen in 2 patients (1.4%). One patient suffered an intraparenchymal bleed on post-op day 11 and 1 patient had a minor stroke leading to overall permanent neurological morbidity of 1.4%

**Conclusion** Our study is the first to report the early experience with the newly FDA-approved PED Flex with Shield technology amongst US centers. Our results are comparable with non-US, international studies showing a high technical success rate and safe peri-procedural angiographic and patient outcome. Long-term follow-up will be needed to provide more robust data on angiographic and patient outcomes.

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**O-008 THE CERUS TRIAL: CONTOUR FOR BIFURCATION ANEURYSMS**

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The Contour is a novel intra-aneurysmal flow disrupting device to treat intracranial aneurysms. To evaluate the safety and effectiveness of the Contour in nonruptured intracranial bifurcation aneurysms, we conducted a prospective, multicenter, single-arm study on thirty-four patients. The primary end points were occlusion status at 6 and 12 months as well as major stroke within 6 mo. Secondary end points were retreatment rate, procedure time, and procedure-related/device-related adverse events. An independent core lab reviewed all the images. Adverse events were reviewed by a clinical events committee.

32 of 34 aneurysms were successfully implanted. Two patients in the intention-to-treat group did not receive the Contour and were excluded from follow-up. Two were lost to angiographic follow-up and regarded as treatment failure. The primary safety end point was met in 2 patients in the ITT group.

Complete occlusion was seen in 14/32 (44%) at 6 mo and 22/32 (69%) at 12 mo. Adequate occlusion (Raymond-Roy [RR] 1 and 2) was reached in 84% at a last available follow-up. One patient from the ITT group and 1 from the PP group received additional treatment during follow-up.

We conclude that the Contour appears to be both safe and effective in the treatment of intracranial bifurcation aneurysms. These results warrant further studies in the future.

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