treatment outcomes. In the future, these sex differences could impact management strategies.

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E-023

ALAGILLE SYNDROME WITH BILATERAL LARGE PARA-OPHTHALMIC ANEURYSMS IN A 14-YEAR-OLD GIRL: TREATMENT STRATEGY AND REVIEW

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Background Alagille syndrome (AGS) is a pediatric multisystem autosomal dominant disorder caused by mutations in the JAG1 and NOTCH 2 genes. The feature of the syndrome is broad-spectrum including bile duct paucity with cholestasis, characteristic facies, and anomalies in the cardiac, renal, skeletal, ocular system. Various intracranial vascular abnormalities have also been reported. We describe a case of AGS with bilateral large unruptured para-ophthalmic aneurysms, which were successfully treated with endovascular therapy.

Subject and methods A 14-year-old girl with genetically diagnosed AGS presented with bifrontal pressure headache. MRI of the brain showed no intracranial hemorrhage. However, MRA revealed bilateral internal carotid artery (ICA) supraclinoid segment aneurysms, which increased in size on the follow-up MRA. A diagnostic cerebral angiogram confirmed large para-ophthalmic aneurysms; 8×9×16 mm with 6 mm neck (right), 7×8×12 mm with 4 mm neck (left), with dysplastic supraclinoid ICAs and M1 segments (figure A). Therefore, a decision was made to treat the aneurysms with endovascular measures.

Results The treatment team was assembled with pediatric hepatobiliary and hematology services in concerning her underlying liver dysfunction, age, and anticipation of using intracranial stents or flow diversion devices with dual antiplatelet therapy (DAP). Platelet function assay, P2Y12 platelet function, and liver function tests were carefully monitored pre- and post-procedure to adjust the DAP. The right ICA para-ophthalmic aneurysm was treated with Pipeline Embolization Device and detachable coils successfully. Four weeks after, the left ICA para-ophthalmic aneurysm was also treated

successfully with the same maneuver. In each treatment, the patient was discharged to her home on the following day without complication. Clopidogrel was discontinued after six months with the continuation of aspirin 81 mg daily. The bifrontal pressure sensation disappeared, and no new symptom has been reported since the treatment. One year follow up angiogram illustrates complete aneurysm dome occlusion and the flow diversion device patency (figure B).

Conclusion To our knowledge, this case is the first report of treated the intracranial aneurysms associated with AGS utilizing flow diversion devices. The growing body of literature describes the intracranial aneurysm and intracranial hemorrhage lead to significant morbidity and mortality in patients AGS. It would be warranted to screen with noninvasive imaging modalities, such as MRA and CTA for the patients with AGS who develop alarming neurovascular symptoms. Further, if indicated, endovascular therapy with multidisciplinary team would be considered in the setting of multisystem disorders such as AGS.

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E-024

LOW PROFILE TRANSRADIAL PIPELINE EMBOLIZATION

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Purpose Retrospective review of all Medtronic Pipeline Flex flow diverting stent placement at single center with attention to guiding catheter selection, technical success, intracranial complications, access site complications and length of procedure. Summarize technical advantages and limitations of each access strategy and present a simplified 6 French triaxial system for flow diversion stent placement via a transradial/transulnar approach. We also present some tips and tricks to optimize procedural success including transulnar access and direct radial access.

Materials and methods Single Center retrograde suspect of review of all Medtronic Pipeline Embolization Flex procedures performed between October 2015-March 2019 via arm access (radial or ulnar). Three different 6F constructs were used for arm access:

1. Direct radial access with long sheath—Terumo destination slender

Abstract E-023 Figure 1

Abstract E-024 Figure 1

2. Benchmark radial access
3. Codman Envoy DA radial access

Primary endpoints include time from radial accessed to target lesion, time from radial access to pipeline embolization deployment, technical failure requiring alternative access, intracranial complications, radial access site complications, occlusion rates at longest available follow-up were delayed neurologic complications.

Results A total of 23 patients were included in this retrospective analysis. Average patient age and male gender were 60.4 years and 22% respectively. A total of 31 devices were used to treat a total of 30 aneurysms. Average aneurysm size was 7 mm. Primary placement of a flow diverting stent was performed in a majority of patients with adjunctive coil placement was performed in 13.1% procedures. Post stent placement balloon angioplasty was performed in 34% procedures. No intracranial complications including dissection, intracranial hemorrhage, symptomatic embolic stroke were identified. Major access site complications and symptomatic delayed radial artery occlusion were not identified in any patients undergoing arm access. Furthest available follow-up was on an average of 9.8 months. Complete occlusion was achieved in 70% patients (we anticipate further occlusion by one year). Additional pipeline embolization devices were required in 1 patient, at 18 months. Foley catheter and arterial line placement, 35% and 22%, respectively.

Limitations Single center retrospective review, short interval follow-up (less than 1 year), and some patients lost to follow-up.

Conclusion 6 French Triaxial Trans-radial (or ulnar access) can be used in placement of a Pipeline Embolization Flex device with low associated complications and high technical success.

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E-025 EVALUATION OF A COMPUTER MODELING SYSTEM FOR FLOW DIVERTER TREATMENT PLANNING

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Introduction Flow diversion is an effective treatment option for cerebral aneurysms (CAs). Appropriately sizing flow diverters (FDs) is critical for treatment success.¹ However, FDs can be difficult to size. They can elongate by more than 50% of their nominal length after deployment and vessel diameters may vary considerably along the trajectory of the vessel.² Current convention does not address these challenges well. Here we present our preliminary evaluation of a computer modeling system that uses real-time FD deployment simulations and the three-dimensional (3D) model of the patient's vessel to size FDs.

Materials and methods The computational modeling system was evaluated for a series of 7 CAs that were planned for treatment with the Pipeline Flex (Medtronic, USA) FD. Evaluation was performed retrospectively in 2 CAs and prospectively in 5 CAs. In each case, rotational angiography image data were first uploaded to the SurgicalPreview® (EndoVantage, USA) computational modeling software. The image data were then segmented by the software and used to reconstruct a 3D model of the vessel. Next, FD sizes that were being considered for treatment were virtually deployed into the vessel model in real-time and the appropriate FD size for each vessel was selected. Simulated and clinical FD deployments were then compared using post-treatment angiography images.

Results Good qualitative agreement was observed between simulated and clinical FD deployments based on device length and aneurysmal neck-coverage, as shown in figure 1. In the prospective cases, the simulations helped narrow the list of device sizes being considered and improved confidence in device selection.