E-064 REMOTE NON-FLOW RELATED INTRACRANIAL ANEURYSMS (IAS) ASSOCIATED WITH DURAL ARTERIOVENOUS SHUNTS (DAVSS) – INCIDENCE, CLINICAL PRESENTATION, TREATMENT AND OUTCOME. A CASE SERIES AND REVIEW OF THE LITERATURE

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Background Intracranial aneurysms (IAs) associated with dural arteriovenous shunts (DAVSs) are rare and infrequently discussed in conjunction with brain arteriovenous malformation (bAVM). We studied at two cerebrovascular centers IAs and associated DAVSs.

Patients and methods Between 2005 and 2018, 103 subjects with DAVSs were retrospectively analyzed for the presence of remote IAs. Demographics, clinical symptoms, aneurysm and DAVS location, treatment and clinical outcomes were studied. Pertinent literature on IAs associated with DAVSs was also reviewed.

Results In our study the incidence of remote IAs associated with DAVSs was 13.6%. Fourteen patients with Borden type DAVS I-III (m/f 1:1; age: 32–84 yrs; mean: 60 yrs) harbored a total of 18 aneurysms. Five patients had multiple aneurysms. High cervical DAVSs were found in 4 subjects. Eleven patients presented with history of a high blood pressure. Most common symptoms were headaches and tinnitus (n= 6) followed by subarachnoid hemorrhage (SAH) and or intracranial hemorrhage (ICH) in 6 patients and cranial nerve deficit in one patient. Treatment was commenced in a staged fashion initially addressing the symptomatic lesion. Eleven DAVSs and 9 aneurysms were successfully treated endovascularly while one patient underwent surgery for his DAVS and 2 aneurysms were clipped. A total of 6 tiny unruptured aneurysms and one high-cervical DAVS as well as a frontal slow-flow DAVS did not receive any treatment for various reasons. Seven aneurysms were treated with and without stent-assisted coil embolization and one pericallosal artery aneurysm was successfully treated with a flow diverter. There were no treatment related complications. Follow-up angiography showed an untreated low-flow DAVS shrank in size and another DAVS spontaneously resolved. During clinical follow-up period, 11 subjects presented with a mRS score of 0 while 3 subjects had a mRS of 1. Literature review included a total of 28 cases with 41 aneurysms. Data were compared with our own findings.

Conclusions Since remote IAs were not flow-related but showed typical distribution, DAVSs may share the pathomechanism with IAs. Most IAs were located in the anterior circulation and half of the DAVS were found in the anterior cranial fossa. Aneurysm rupture was more common than a bleed from the DAVS, especially when multiple IAs were present. Carefully planned and executed EVT and surgery was effective for this complex population with an excellent long-term clinical outcome.

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E-065 RUPTURED BRAIN ARTERIO-VENOUS MALFORMATIONS IN CHILDREN AND ADULTS: ANGIOARCHITECTURAL VARIATIONS AT PRESENTATION ACROSS THE LIFESPAN

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Background and Purposes Intracerebral hemorrhage is the most feared complication of brain arterio-venous malformation bAVM. In patients with ruptured bAVM, the biological and structural angioarchitectural continuum leading to hemorrhage through the lifespan has been scantly reported. In this multicenter retrospective cohort study, we aimed to determine whether ruptured bAVM angioarchitectural features vary across the lifespan.

Methods Pediatric patients with ruptured bAVM referred to a pediatric quaternary care center between 2000 and 2018 and adult patients referred to a tertiary care center between 2003 and 2018 were pooled and retrospectively analyzed. Baseline clinical, demographic and imaging data were either prospectively acquired or retrospectively retrieved from medical charts. Imaging were then retrospectively reviewed for key bAVMs angioarchitectural characteristics, i.e, nidus size, location, Spetzler Grade, venous drainage and arterial or nidal aneurysm. First, demographic, clinical and angioarchitectural characteristics between children and adults were compared. Second, data for pooled sample was analyzed by using Kaplan-Meier survival analyses and log-rank tests, hypothesizing that bAVM and its angioarchitectural features were present at birth: survival started at the time of birth and ended at the date of bAVM rupture. A threshold of $p<0.05$ was considered significant.

Results A total of 309 patients with ruptured bAVM were included, with 111 children (mean age 9.5 ±3.7) and 198 adults (mean age 43.3 ±15.7), 43% females in both cohorts. Children presented with larger nidal sizes (mean 24.7 mm ±14.3 vs 18.9 ±14.2 $p<0.001$; Correlation coefficient -0.11 [-0.22—0.03], $p=0.04$), more frequent central and supra-tentorial location of bAVM (respectively 56.4% vs 22%, $p<0.001$, and 86% vs 77%, $p=0.04$), and less frequent flow-related arterial or intranidal aneurysms (respectively 2.8% vs 17% and 13% vs 24%, both $p<0.01$). Other angioarchitectural features did not differ significantly between cohorts. Using age at diagnosis as a continuous variable, earlier presentation of ruptured bAVM, was associated with central/deep and supra tentorial locations (log rank $p<0.01$for both) and with deep or mixed venous drainage (log rank $p=0.019$). On the contrary, Flow related or intra-nidal