dissecting stenosis in one lumen and fusiform aneurysm in second lumen is not described.

Objective To report a case of ICA dissection originating from a duplicated ICA that caused an intracranial occlusion and extracranial fusiform aneurysm. Additionally, we report our endovascular salvage strategies.

Case A 41-year-old woman with history of hypertension and migraines presented with worsening headaches. Angiography demonstrated left ICA dissection without critical stenosis, but small pseudoaneurysm, patient was managed conservatively. Follow-up MRA required for worsening symptoms, showed deteriorating dissecting-narrowing at the skull-base in the petrous ICA. Emergent angiography revealed a dissecting long segment lesion extending from the distal cervical carotid artery to the petrous segment with critical stenosis of 90%. Duplicated ICA originated 20 mm from the ICA origin and ended at C2 level meeting the original ICA from where the dissection began. The other duplication demonstrated a fusiform dilation at the center. Petrous ICA was repaired by PTA followed by Neuroform EZ stent and distal cervical ICA was reconstructed with additional 3 Neuroform Allas stents. Despite reconstruction, antegrade flow to the ICA remained slow due to the competitive flow from other duplications. Emergent shut-down of the fusiform duplication obtained by embolizing 3 large Stryker XL coils resulting in restoration of antegrade flow to the stented segments. Patient remained neurologically intact and discharged home in 2 days.

Conclusions Carotid duplication may lead to dissection and fusiform aneurysm formation. Competitive flow from duplication may responsible for dissection. Sacrifice of one of the duplication of the ICA, especially, the fusiform one is needed to maintain persistent antegrade flow.

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E-122 YTTRIUM-90 RADIOEMBOLIZATION AS A POSSIBLE NEW TREATMENT FOR BRAIN CANCER: PROOF OF CONCEPT AND SAFETY ANALYSIS IN A CANINE MODEL

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Introduction/Purpose Glioblastoma multiforme is the most common and aggressive type of brain tumor, with a median survival time of 15 months despite treatment. We propose the use of Y-90 endovascular radiosurgery (ER) to increase treatment efficacy while reducing the neurotoxicity associated with radiotherapy in glioblastoma. To that end, this study aimed to evaluate the safety and feasibility of Y-90 ER in the treatment of glioma in a canine model.

Materials and Methods Three healthy research dogs (R1-3) and five client-owned dogs on anti-epileptics with spontaneous, intra-axial brain masses (P1-5) received unilateral Y-90 glass microsphere infusions in either the PCA (R1), MCA (R2), or ICA (R3, P1-5), followed by quantitative Y-90 PET/

CT. R1-3 had neurological exams, as clinically indicated, and a 4-week post-ER MRI. P1-4 had serial neurological exams and 1-, 3-, and 6-month MRIs. Due to a small sample size, only descriptive statistics are reported.

Results R2-3 developed transient neurologic defects consistent with the treated side, which resolved in 13 days. R1 had no post-procedure neurologic deficits. The treated hemisphere in R1-3 received a maximum of $378 \pm 121 \text{ Gy}$ ($x \pm \sigma$) of radiation, with maximum dose twice as high in more distal deliveries (PCA, MCA). MRIs at 1 month were normal without atrophy or microinfarction.

All dogs except P2 were on corticosteroids and seizure-free prior to treatment. P1-3 had transient post-procedure neurologic deficits which resolved in 20–33 days, while P4 had no neurologic deficits. P5 passed away 12-hours post-ER. The masses received $46.2 \pm 11.7 \text{ Gy}$ of radiation with $19.3 \pm 12.2\%$ of the mass volume receiving $>70 \text{ Gy}$. MRIs at 1-month post-ER showed decreased mass size in all four dogs: by 69% and 59% in P1 and P2 on post-contrast MRI and by 24% and 26% in P3 and P4 on FLAIR MRI. The average number of spheres per cm^3 of lesion, calculated using the measured activity per cm^3 on PET/CT and expected activity per bead, ranged from 1490 (P2) to 5280 (P1).

At 53 days, P2's seizures returned with tumor enlargement, and he was euthanized 5 months post-ER. P1 remained asymptomatic until her 6-month visit, when left rear limb proprioceptive delay was observed. At her 12-month follow-up, left thoracic limb proprioceptive delay was also observed, though this did not suggest significant change in the known right cerebral cortex lesion. P3 remained asymptomatic with stable disease at his 6-month visit. P4 developed medically manageable seizure activity and a unilateral menace deficit with no mass growth on MRI at 3 months post-ER, though at 6 months mass volume began trending towards pre-treatment size.

Conclusion Y-90 ER in the canine brain is technically feasible and caused no permanent neurologic deficit despite $>400 \text{ Gy}$ of radiation to critical brain structures. Four of five patient dogs had favorable dosimetric, radiologic, and clinical outcomes, all outliving the 63-day mean survival time associated with their original diagnosis and symptomatic treatment. Long-term outcomes, histopathology, and a larger sample size are needed to better understand brain Y-90 ER viability.

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E-123 MIDDLE MENINGEAL ARTERY EMBOLIZATION FOR CHRONIC SUBDURAL HEMATOMAS: AN INSTITUTIONAL ANALYSIS

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Introduction Chronic subdural hematoma (cSDH) is one of the most common neurological diseases, often causing significant morbidity especially in the elderly population. Recently, middle meningeal artery (MMA) embolization has emerged as

a potentially safe and effective method of treating cSDH. Pertinent literature, however, remains limited. The current study reports our center's experience with MMA embolization and examines the type of embolic material used, the extent of penetration, and MMA branches embolized.

Methods A prospectively maintained endovascular treatment database was retrospectively analyzed for all patients whom underwent MMA embolization from January 1st, 2018 to December 31st, 2019. Six patients without at least 30 days of follow-up were excluded. A failed outcome was defined as either surgical rescue and/or >10 mm of residual or reaccumulation after MMA embolization. Secondary outcomes included: complete and near-complete (<5 mm) resolution of the cSDH, mRS >2 on follow-up, and worse mRS on follow-up.

Results The 34 patients that met the inclusion criteria had an average age of 68 ± 12 years. Twenty-four patients were male (71%). Twenty-three had suffered a preceding trauma (68%), and 13 were on antiplatelet or anticoagulant (38%) medications. Headache (N=14, 41%), focal neurological deficit (N=15, 44%), and altered mental status (N=11, 32%) were the most common presenting symptoms. Nine (26%) had failed surgery and 6 (18%) had failed conservative treatment. Transradial access was utilized for 20 patients (59%). One ischemic complication (3%) occurred in a patient with a type 3 arch who underwent transfemoral embolization. Average preoperative mRS was 2.0 ± 1.4 and follow-up mRS was 1.8 ± 1.4 with an average follow-up days of 110 ± 72 . Ten patients (29%) had a mRS >2 and 1 patient (3%) had a worse mRS on follow-up. A total of 40 MMA embolizations were performed (6 patients with bilateral cSDH had bilateral MMA embolization). Embolic agents included Onyx (N=27, 68%), particles (N=9, 20%), and NBCA (N=4, 10%). Both the anterior and posterior MMA branches were embolized in 27 (68%) and distal penetration of these branches was achieved in 23 (58%) patients. Twenty-two cSDHs (55%) completely resolved while 33 (83%) had either complete or near-complete resolution. Failed embolization occurred in only 3 cSDHs (8%), none in patients in whom both anterior and posterior MMA branches embolized ($p=0.029$).

Conclusion In our series, our procedure has evolved to transradial access for Onyx embolization which is both safe and efficacious. Furthermore, embolization of both the anterior and posterior MMA branches may be associated with a decrease risk of failed treatment. Future randomized control trials and/or large prospective studies are warranted, with attention to optimizing the procedural technique.

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COMBINED DILUTED N-BCA GLUE AND PARTICLE EMBOLIZATION FOLLOWED BY A 'SUGAR RUSH' D5W BOLUS IN MIDDLE MENINGEAL ARTERY (MMA) EMBOLIZATION FOR CHRONIC SUBDURAL HEMATOMAS: A PROSPECTIVE SAFETY AND TECHNICAL FEASIBILITY STUDY

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Introduction In recent years, embolization of the middle meningeal artery (MMA) for treatment of refractory or recurrent chronic subdural hematomas (SDH) has gained momentum. The rationale is the formation of the neo-membrane, with the MMA providing feeding vessels to the outer membrane connected to the dura mater. Various techniques like the use of polyvinyl particles and Onyx have been explored. We present the technical feasibility of using very diluted n-butyl-2-cyanoacrylate (NBCA) for embolization.

Methodology Patients were enrolled from Westchester Medical Center from September 2019- March 2020, with chronic refractory or recurrent subdural hematomas. Informed consent was obtained from patients and/or families. Embolization of the frontal and parietal branches of the MMA was performed using a very dilute mixture of 1:6 n-BCA and ethiodized oil, with 5% dextrose (D5) boluses from the guide catheter to improve the distal penetration of the glue. Visibility was improved by using Tantalum powder. Cases with ophthalmic collaterals from the MMA were excluded. The prowler select plus Codman Neuro (Johnson & Johnson), 2.3. 0.021 was used for all cases. Follow up CT head was performed at day 7, day 21 and 3 months.

Results A total of 11 patients were prospectively enrolled. The mean age was 71 years, male to female ratio of 2:1. 10 of the 11 cases were traumatic, one was a patient with lupus on anticoagulation. A total of 5 of 11 patients were on anticoagulation at the time of the SDH. Nine of the 11 patients had prior neurosurgical intervention including subgaleal drains and burr holes. The 7 day follow-up CT head was available for 9 of 11 and demonstrated improvement (>50% reduction in SDH volume) in 7/9 (77%), with 2/9 (22%) showing an unchanged or stable SDH. Day 21 CT head was available for 5/7 patients (71%), all demonstrating significant further improvement (>75% reduction in SDH volume). There were no intra or post procedural complications (non-target embolization or unintentional retention of the catheter) in the 11 patients enrolled (0%).

Conclusion Embolization of the MMA using very diluted n-BCA and ethiodized oil (1:6) is safe and effective for chronic SDH patients with a low risk of recurrence, and is considered an effective therapeutic intervention to arrest hematoma enlargement and promote resolution. The use of a 'sugar rush' D5 bolus improves distal penetration of the glue.

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E-125

PRIMARY RAPID-EXCHANGE CORONARY BALLOON ANGIOPLASTY FOR THE TREATMENT OF RECURRENT SYMPTOMATIC INTRACRANIAL ATHEROSCLEROTIC DISEASE

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Background Treatment of intracranial atherosclerotic disease (ICAD), a common cause of ischemic stroke worldwide, has been highly controversial. The SAMMPRIS trial revealed that best medical management (BMM) is superior to Gateway balloon angioplasty and Wingspan stenting for patients with symptomatic high-grade ICAD. Therefore, stenting is reserved for those failed BMM. Early evidence suggests that primary balloon angioplasty (PBA) may be an alternative option for