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 were 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.


E-124 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


10.1136/neurintsurg-2020-SNIS.156

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.


E-125 PRIMARY RAPID-EXCHANGE CORONARY BALLOON ANGIOPLASTY FOR THE TREATMENT OF RECURRENT SYMPTOMATIC INTRACRANIAL ATHEROSCLEROTIC DISEASE

Y Lodi*, S Chin, B Pulgarin, Z Weiss, V Reddy. Neurology, Neurosurgery and Radiology, Upstate Medical University/UHS-Wilson Medical Center, Johnson City, NY

10.1136/neurintsurg-2020-SNIS.157

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
ICAD who fails BMM. However, PBA of non-rapid-exchange system for ICAD has been frequently undermined due to the increase incidence of arterial recoil, restenosis and dissection.

**Objective** We report three cases of PBA using rapid-exchange coronary balloon for the treatment of symptomatic refractory ICAD in the vertebrobasilar arterial system who failed BMM. Cases: The cases consist of a 73-year-old-man with 90% vertebral artery stenosis, a 66-year-old-woman with 95% vertebrobasilar junction stenosis and a 49-year-old man with 98% stenosis of the basilar artery. Patients had history of hypertension, hyperlipidemia and smoking and failed BMM. Therefore, underwent rapid-exchange PBA using undersized Maverick coronary balloons. First case required single PBA using 2.5 × 20 mm balloon, 2nd required two PBA with 2 × 20 mm in two sessions and 3rd required single session three PBA using 2 × 20 mm. PBA resulting in reduction of stenosis less than 50% in all without any events and achievement of good clinical outcomes.

**Conclusions** Rapid-exchange PBA is technically feasible and may offers an alternative option to refractory ICAD who fails BMM. Further studies are warranted.

**Disclosures** Y. Lodi: None. S. Chin: None. B. Pulgarin: None. Z. Weiss: None. V. Reddy: 2; C; Terumo. 3; C; Janssen, Chiesi Inc; Portola.

**E-126 TRANS RADIAL ONYX MIDDLE MENINGEAL ARTERY EMBOLIZATION FOR SUBACUTE CHRONIC SDH: SINGLE CENTER SERIES**

1G. Rajah*, 1M. Waqas, 2R. Dossani, 2A. Gong, 2K. Rho, 2S. Housley, 2H. Rai, 2F. Chin, 2M. Tso, 1E. Levy, 1A. Siddiqui, 1K. Snyder, 1J. Davies. 1Neurosurgery, University at Buffalo, Buffalo, NY; 2Jacobs School of Medicine, University at Buffalo, Buffalo, NY

**Introduction** Middle meningeal artery (MMA) embolization for the treatment of subacute/chronic subdural hematoma (cSDH) is an emerging therapy for minimally invasive treatment of subdural blood products. Trans radial access (TRA) may offer certain benefits to this patient population who are often on blood thinners with multiple comorbid medical issues.

**Methods** 46 consecutive patients between 2018 and January of 2020 undergoing trans radial access for MMA embolization with Onyx were analyzed from a single center prospectively maintained database. Patient demographics, comorbidities, ambulatory times, subdural resorption status, and guide catheter type were recorded. We specifically looked at conversion to femoral access and complication rates from access for this series. Multivariate analysis with SPSS version 25 was utilized.

**Results** 46 patients were included in this study. The average age was 71.7 ± 14 years. TRA was successful for MMA embolization in 44 patients (95%). There were no access site complications. The mean cSDH size was 14 ± 5 mm, 5 patients had recurrent cSDH prior to undergoing MMA embolization (10.8%). 4 patients (8.7%) had adjuvant MMA embolization performed within 24 hrs of burr hole evacuation. Symptomatic improvement was seen in 88.6% of patients (39/44). Mean length of stay was 4 ± 3 days, all patients previously ambulatory were ambulated immediately after procedure. 3 patients were appropriate for same day discharge. Mean follow-up was 8 weeks ± 4, 86.4% of patients had either resolution or partial resolution of the cSDH at mean follow-up. Univariate analysis revealed use of antiplatelet agents was associated with failed resorption of cSDH (83.3% vs 23%, P=0.009). Charlson comorbidity index, gender, age, and treatment approach (adjuvant vs primary) were not associated with failed resorption status. 48% of patients had a Charlson Comorbidity index >5. 91% of TRA embolizations were performed with a 6F 071 guide catheter.

**Conclusion** MMA embolization with Onyx for cSDH appears to result in symptomatic and radiographic relief in the majority of patients. Trans radial access via 6F 071 guide catheter in this population with numerous comorbidities offers a safe and effective strategy for early ambulation and procedural success.


**E-127 CLOPIDOGREL HYPER-RESPONSIVENESS IS ASSOCIATED WITH HEMORRHAGIC COMPLICATIONS POST CEREBROVASCULAR STENTING PROCEDURES**

1S. Muram*, 2K. Panchendrabose, 3M. Eagles, 3M. Suheel, 2A. Mitha. 1Neurosurgery, University of Calgary, Calgary, AB, Canada; 2Biomedical Engineering, University of Calgary, Calgary, AB, Canada

**Background** Anti-platelet therapy is an important part of the treatment regimen in patients who are receiving a cerebrovascular stent, in order to reduce the incidence of thrombembolic complications. However, there is a known variation in patient response to anti-platelet medications. Theoretically, patients with decreased responsiveness may be at increased risk of ischemic complications while those with increased responsiveness may be at a heightened risk of bleeding. The objective of this investigation was to determine if patients with an increased response to clopidogrel were at an increased risk of developing post-procedural hematomas.

**Methods** A prospective Research Ethics Board (REB) approved study was performed on consecutive patients undergoing endovascular placement of a cerebrovascular stent at the Foothills Medical Centre in Calgary, Alberta from 2019–2020. Inclusion criteria were patients over 18 years of age, and on dual antiplatelet therapy consisting of aspirin and clopidogrel for at least 3 days prior to the procedure. Platelet function testing was performed on blood samples taken before insertion of the stent using whole blood impedance aggregometry to determine the responsiveness to aspirin and clopidogrel. As per the REB protocol, treating neurointerventionalists were blinded to the aggregometry results. The primary study endpoint was the development of hemorrhagic complications during or after the procedure. Parametric and receiver operator curve analysis was used to assess for predictors of our primary outcome.

**Results** To determine the cut-offs for ASA and clopidogrel responsiveness, whole blood aggregometry was first performed on 25 control patients who were not on anti-platelet agents. Subsequently, 50 consecutive patients undergoing cerebrovascular stenting procedures fit our inclusion criteria. 7 (14.0%) of these patients developed a hematoma either intracranially (n=1) or at the puncture site (n=6). Age, gender, smoking status, access site, or stent location were not associated with hemorrhagic complications. Based on our controls, ASA hyperresponders could not be identified using whole blood aggregometry due to the normal response being 0–1 ohms. With these cut-offs, however, 49 (98%) of our patients were