Results Tissue-digestion with MMPs produced significant changes in arterial structure and the mechanobiological properties. The tissue samples digested with MMPs had a similar morphology and mechanical properties as the elastase group when tested with the rheometer and observed with confocal and AFM imaging. Increases in concentration of MMPs results in a more pronounced decrease in the vessel's mechanical properties (significantly reducing modulus).

Conclusion Further analysis of the tissue samples is underway, in an attempt to quantify the MMP concentration and its correlation to reduced modulus. This study will hopefully lead to the identification of an MMP dose and digestion regimen that can create a reliable benchtop DAR model. A benchtop DAR model would allow for the assessment of new aneurysm treatment options, and the development of new treatment devices for reducing DAR in patients with GIAs.

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P-053

DELAYED PRESENTATIONS, INCREASED COMPLICATIONS, AND WORSE OUTCOMES AFTER ANEURYSMAL SUBARACHNOID HEMORRHAGE IN THE COVID-19 ERA

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Introduction The COVID-19 pandemic has led to excess mortality out of proportion to documented COVID-19 cases while also affecting the care of non-COVID-19 related diseases. No data exist on the effects of the COVID-19 pandemic on the care and outcomes of patients with aneurysmal subarachnoid hemorrhage (aSAH). Here we determine the impact of the COVID-19 pandemic on latency to presentation and clinical outcomes for aneurysmal subarachnoid hemorrhage.

Abstract P-053 Figure 1

Methods We performed a retrospective cohort study of all patients presenting to a single center in Atlanta, Georgia, USA with aSAH between 2012 and 2020. COVID-19 was first reported in Georgia on March 2, 2020. All patients presenting from March 2nd through June 30th of a given calendar year were compared from the pre-COVID-19 era (2012-2019) to the COVID-19 era (2020). Patient characteristics, latency from ictus to presentation, and clinical outcomes were compared. Every index digital subtraction angiogram was scored for the presence of vasospasm, and all cranial imaging studies were reviewed for infarcts consistent with delayed cerebral ischemia.

Results 470 patients presented with aneurysmal subarachnoid hemorrhage during the study period. 433 and 37 presented before and during the COVID-19 era, respectively. Compared to the pre-COVID-19 era patients, patients presenting during the early phase of the pandemic were more likely to delay presentation (2.3 ± 1.3 days vs. 0.9 ± 2.2 days, respectively, $p < 0.01$). Delays to presentation were driven by low and mid-grade subarachnoid hemorrhage patients (2.8 ± 3.1 days vs. 1.0 ± 2.2 days, $p < 0.01$) with no differences noted in high-grade subarachnoid hemorrhage patients. The COVID-19 era was independently associated with significantly increased rates of angiographic vasospasm on presentation (aOR 2.52, 1.01 - 6.29, $p = .048$), delayed cerebral ischemia (aOR 3.84, 1.74 - 8.50, $p = .001$), and in-hospital aneurysmal re-rupture (aOR 5.75, 1.05 - 31.54, $p = .044$). Presentation during the COVID-19 era was independently associated with increased in-hospital death or hospice disposition in adjusted analysis (aOR 3.05, 1.03 - 9.04, $p = 0.04$).

Conclusions In this retrospective cohort, aSAH the COVID-19 era is associated with delayed presentation and attendant increases in cerebral vasospasm, delayed cerebral ischemia, aneurysmal re-rupture, and increased in-hospital mortality/hospice disposition. These data demonstrate a novel association between the COVID-19 pandemic and aneurysmal subarachnoid hemorrhage care, highlighting increases in overall mortality in non-COVID-19 associated disease driven by the ongoing pandemic.

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Abstract P-054 Figure 1 Left - 3 NeuroCURE samples imaged on a calibrated fluoroscope (day 49). Right - 8-month contrast elution from NeuroCURE. 72% of original radiopacity is maintained.

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LONG-TERM RADIOPACITY OF A POLYMER ANEURYSM TREATMENT DEVICE: NEUROCURE® LIQUID EMBOLIC

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Introduction The goal of this research is to determine the long-term radiopacity of a polymer device for the treatment of aneurysms. The polymer device is a liquid embolic under development called: NeuroCURE® (Aneuvus Technologies, Inc. (ATI) - Flagstaff, AZ). NeuroCURE® is a non-adhesive, elastic polymer gel (a form of polypropylene diacrylate - PPODA) that self-coalesces and can completely fill an aneurysm sac (90-100% volume fill) in less than 10 minutes. Polymer devices can be made radiopaque by mixing in contrast agents with the gel, however, the contrast often leaches out over time - reducing long-term visibility. As part of an FDA study, the long-term visibility of NeuroCURE was assessed, for up to one year.

Materials and Methods NeuroCURE is formulated to contain 24 vol% Conray-60® liquid contrast agent, for fluoroscopic visualization. To simulate NeuroCURE delivery in an in vivo aneurysm environment, three 0.5 ml NeuroCURE samples (equivalent volume of a large aneurysm) were delivered to three 35 µm mesh cell strainers submerged in 55 ml of sterile phosphate-buffered saline (PBS). The samples were kept in an incubator at 37 °C. Four control solutions, containing 24%, 16%, 8%, and 0% (PBS only) The control samples were used to calibrate the fluoroscope and compare the NeuroCURE sample radiopacity change over time.

Results The three NeuroCURE samples are significantly more radiopaque than the ASTM aluminum standard for polymer devices (figure 1A). Results show that 12% of NeuroCURE radiopacity is lost within the first day of implantation. However, further loss of radiopacity is limited to approximately 2% per month. After 8 months, NeuroCURE retains 72% of the original radiopacity (figure 1B).

Conclusion The polymer structure of NeuroCURE retains significant radiopacity over the long-term, allowing for radiographic follow-up in aneurysms treated with NeuroCURE. This was also confirmed in a 12-month in vivo animal study in canines, where the NeuroCURE-treated aneurysm was