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.

Disclosures **F. Akbik:** None. **C. Yang:** None. **B. Howard:** None. **J. Grossberg:** None. **L. Danyluk:** None. **K. Martin:** None. **A. Alawieh:** None. **R. Rindler:** None. **F. Tong:** None. **D. Barrow:** None. **C. Cawley:** None. **O. Samuels:** None. **O. Sadan:** None.

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

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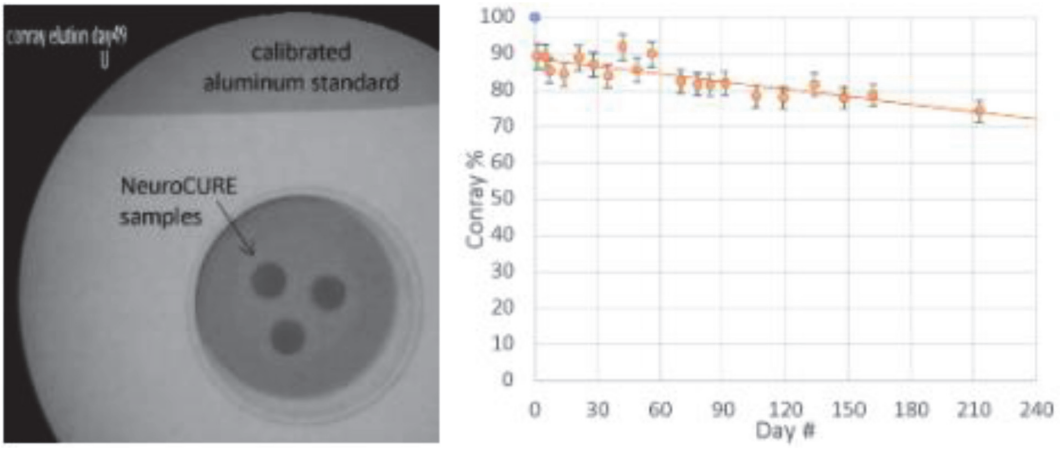
Introduction The goal of this research is to determine the long-term radiopacity of a polymer device for the treatment of aneurysms. The polymer device is a liquid embolic under development called: NeuroCURE® (Aneuvas Technologies, Inc. (ATI) - Flagstaff, AZ). NeuroCURE® is a non-adhesive, elastic polymer 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 visability. 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 contast 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



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.

visible at term. This study estimates that the NeuroCURE device retains up to 64% of its original radiopacity after one year.

Disclosures B. Fennell: None. **W. Merret:** None. **H. Sodawalla:** None. **J. Vigil:** None. **T. Becker:** None.

55 LARGE, WIDE-NECK ANEURYSM CANINE MODEL TREATED WITH NEUROCURE® LIQUID EMBOLIC – 12-MONTH SURVIVAL

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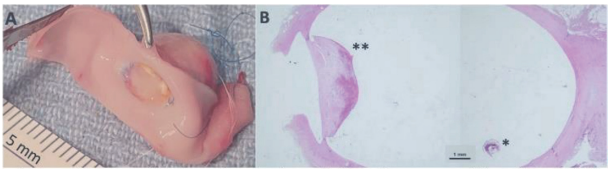
Introduction High recanalization rates of large aneurysms embolized with current devices can be attributed in part to limited modeling of larger aneurysms during preliminary device testing in animal models. We developed a clinically-relevant in vivo canine model of large, wide-neck aneurysms to study aneurysms with traditionally high recanalization rates post-treatment. This model was then treated with a new liquid embolic device under development: NeuroCURE® (Aneuvas Technologies, Inc. (ATI) - Flagstaff, AZ). NeuroCURE® is a non-adhesive, elastic polymer gel (a form of polypropylene diacrylate – PPODA) that self-coalesces and completely fills the aneurysms sac in less than 10 minutes.

Materials and Methods The canine large aneurysm model was developed by the Neurosurgery Research Center at Barrow Neurological Institute (BNI – Phoenix, AZ) and completed as a GLP study at American Preclinical Services (APS – Minneapolis, MN). The study included 10 canines (4 – 3-month, 4 – 6 month, and 2 – 12 month survivals post-embolization)A lateral wall aneurysm was surgically created by anastomosis of an external jugular vein (EJV) segment onto the common carotid artery (RCCA) in the neck. The EJV segment was sewn to the RCCA to form a wide-neck aneurysm (5 – 7 mm diameter). The distal EJV was tied off at a dome height $\geq$ 10 mm. The animals were survived at least 2 weeks pre-embolization to allow for aneurysm maturation, stabilization, and vessel model healing. NeuroCURE® was then delivered under balloon protection using a single 10 minute inflation.

Results Pre-treatment angiographic imaging verified a patent aneurysm with large dome height (>10 mm) and wide-neck morphology (> 4mm neck diameter and midline Dome: Neck (D:N) ratio 1.1:1 to 2:1, **figure 1A**). Post-treatment histology verified healing of the aneurysm neck (full endothelialization and neointimal formation, **figure 1A and B**). Due to the near complete aneurysm filling, GLP histology verified no thrombus formation, no clot reorganization, no neo-angiogenesis, and minimal inflammation across all survival timepoints.



Abstract P-055 Figure 1 A) continuous neointimal growth across the neck of a canine aneurysm (12-month survival); B) H&E stain showing neck neointimal formation (**) at the dimple created by balloon protection, > 90% aneutysm fill (white intrasaccular area is NeuroCURE), and a stabilized remnant of a microcatheter track inside the NeuroCURE gel (*)

Conclusion The canine model was adopted over other models (i.e. rabbit-elastase) because of comparable healing responses to humans, representative blood-flow, similar blood pressure, and vessel sizes that accommodate both large aneurysms and multiple microcatheters. The model and survival timepoints have been approved by the Food and Drug Administration (FDA) for clinical assessment of NeuroCURE®, for which an Investigational Device Exemption (IDE) application is underway.

Disclosures T. Becker: 1; C; NIH grant # 5R42NS097069-03. **W. Merritt:** None. **N. Norris:** 1; C; NIH grant # 5R42NS097069-03. 5; C; Aneuvas Technologies, inc. **A. Ducruet:** 1; C; NIH grant # 5R42NS097069-03.

P-056 IMPROVED FLUID DYNAMICS SIMULATIONS OF COILED CEREBRAL ANEURYSMS USING MICROTOMOGRAPHY AND HOMOGENIZATION TECHNIQUES

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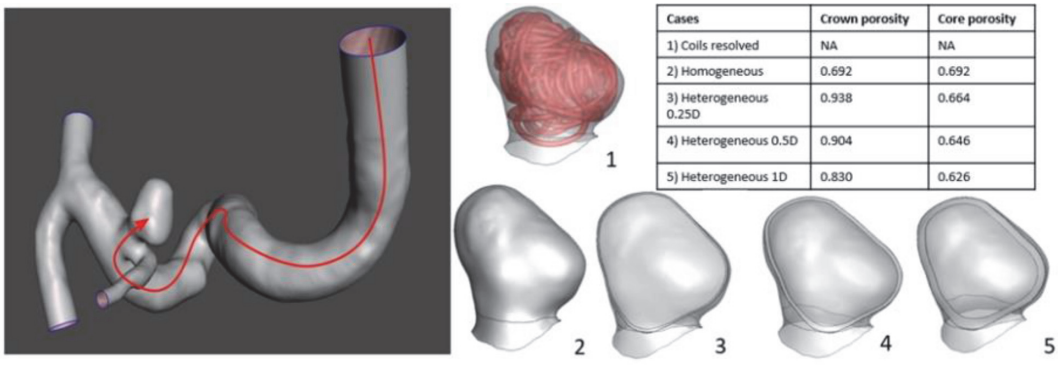
Hemodynamic changes after aneurysm coiling can be simulated using computational fluid dynamics (CFD) to better predict treatment outcomes. Since the geometry of the coil mass is not visible using conventional imaging, most CFD simulations represent coils as a simplified, uniform porous medium. This



Cases	Crown porosity	Core porosity
1) Coils resolved	NA	NA
2) Homogeneous	0.692	0.692
3) Heterogeneous 0.25D	0.938	0.664
4) Heterogeneous 0.5D	0.904	0.646
5) Heterogeneous 1D	0.830	0.626

Abstract P-056 Figure 1 Method of obtaining high-resolution coil geometry