O-041 A UNIQUE EMBOLIC AGENT: SOLVENT-FREE, SHEAR-RESPONSIVE BIOMATERIAL FOR MICROVASCULAR PENETRATION

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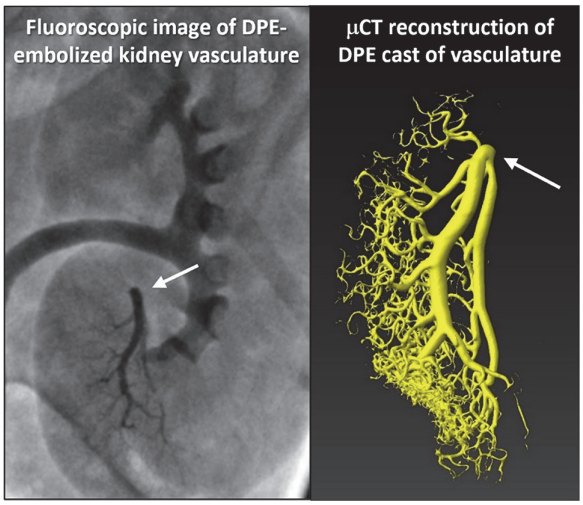
Introduction The Distally Penetrating Embolic (DPE) is a purpose-built, solvent-free, shear-responsive, silicone-based biomaterial designed for embolization applications where complete casting and occlusion of fine vessel branches is desired (e.g., embolization of the middle meningeal artery for meningiomas and chronic subdural hematoma). The DPE is supplied as a three-part system in small-volume syringes that are mixed prior to use, forming an injectable, shear-thinning paste that preferentially drives into distal vessels where shear is highest; ultimately, the DPE cures *in situ* into an elastomeric solid. Here, we report on DPE usability and embolization performance *in vivo*.

Methods Usability: Six neurointerventional radiologists assessed device preparation and injection using a Likert scale (1-very difficult to 5-very easy). Embolization: A total of 57 injections in 20 swine at two sites were performed to acutely evaluate distal penetration and occlusion performance; injections were performed using a 0.017' microcatheter (n=52) or with dual-lumen balloon occlusion (n=5). Seven and thirty-day studies were conducted against commercially-available controls to evaluate embolization and safety performance in kidney vasculature (n=8 per timepoint). Occlusion via angiography, distal penetration via micro-computed tomography (μCT), and biocompatibility via histopathology were assessed.

Results Average device preparation time by clinicians was 2.3 ± 0.4 minutes. Usability was acceptable, and all clinicians were able to hand-inject the material through a 150 cm long, 0.017' microcatheter. When injected into vessels with blood flow, the DPE shear-thinned and was carried distally into small branches; thereafter, it proceeded proximally to fill larger vessels. After injection was stopped, proximal blood pressure continued to 'pack' the material further into the distal vasculature and capillary bed until the material completely cured (~10 minutes from initial mixing). With balloon occlusion, the pressure from injection progressively advanced the DPE proximally to distally, whereupon it shear-thinned and evenly penetrated into small vessel branches. At follow-up, angiography showed effective occlusion of target vasculature without evidence of recanalization. μCT radiographs indicated complete casting of millimeter to micron-sized vessels. Histological sections confirmed full luminal occlusion in vessels down to 30-micron diameter (material was not detected in the venous vasculature). Vessel injury and necrosis were both absent while inflammation was only minimal. No hemorrhage occurred when DPE-embolized kidney tissue was surgically incised.

Conclusion The solvent-free, shear-responsive DPE is an easily prepared, hand-injectable agent that penetrates deeply into distal vessels to provide complete casting and occlusion of target vasculature with favorable biocompatibility. These promising outcomes warrant further study in human subjects.

Disclosures D. Fiorella: 1; C; National Cancer Institute – R44CA257802, Penumbra, Stryker, Balt USA, Siemens. 2; C; Arsenal Medical, Medtronic, Microventoin, Stryker, Balt USA, Mentice, Neurogami, Marblehead, Rapid.AI, Rapid Medical, Phenox, Scientia Vascular. 4; C; Mentice, Neurogami, Marblehead, Scientia Vascular, NVMed. **C. Sadasivan:** 1; C; National Cancer Institute – R44CA257802. **R. Brownlee:** 1; C; National Cancer Institute – R44CA257802. **A. Arthur:** 1; C; Balt USA, Medtronic, Microvention, Penumbra, Siemens. 2; C; Arsenal Medical, Balt USA, Johnson and Johnson, Medtronic, Microvention, Penumbra, Scientia Vascular, Stryker. 4; C; Azimuth, Bendit, Cerebrotech, Endostream, Magneto, Mentice, Neurogami, Neuros, Scientia Vascular, Serenity, Synchron, Tulavi, Vastrax, Viz.ai. **J. Groom II:** 1; C; National Cancer Institute – R44CA257802. 4; C; Arsenal Medical. **C. Guertin:** 1; C; National Cancer Institute – R44CA257802. 5; C; Arsenal Medical. **Q. Pham:** 1; C; National Cancer Institute – R44CA257802. 4; C; Arsenal Medical. **M. Fornaciari:** 1; C; National Cancer Institute – R44CA257802. 4; C; Arsenal Medical. **C. Wiltsey:** 1; C; National Cancer Institute – R44CA257802. 4; C; Arsenal Medical. **L. Core:** 4; C; Arsenal Medical. **U. Sharma:** 4; C; Arsenal Medical.



Abstract O-041 Figure 1

O-042 INCIDENCE OF PERIPROCEDURAL STROKE WITH RADIAL ACCESS FOR DIAGNOSTIC CEREBRAL ANGIOGRAMS

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Introduction/Purpose Over the past few years, transradial access for neurointerventions has gained more popularity due to extrapolated interventional cardiology data, patient preference and early reports of feasibility using this approach. Our aim was to evaluate the incidence of periprocedural stroke in patients undergoing radial versus femoral access for diagnostic cerebral angiograms.

Materials and Methods Retrospective review of our prospectively maintained neurointerventional database and identification of all patients who underwent a diagnostic cerebral angiogram between May 2019 and July 2021. These patients were further divided into radial versus femoral access. Patients