replacing DFD17-2017-001006, which was flagged for being too long and extended one line below the physical limit.

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Intracranial Vascular Disease Evaluation With Combined Vessel Wall Imaging And Patient Specific Hemodynamics KURT SAMSON, MAHMUD MOSSA-BASHA, CHUN YUAN, MARIA DE GADOR CANTON, ALBERTO ALISEDA, University of Washington — Intracranial vascular pathologies are evaluated with angiography, conventional digital subtraction angiography or non-invasive (MRI, CT). Current techniques present limitations on the resolution with which the vessel wall characteristics can be measured, presenting a major challenge to differential diagnostic of cerebral vasculopathies. A new combined approach is presented that incorporates patient-specific image-based CFD models with intracranial vessel-wall MRI (VWMRI). Comparisons of the VWMRI measurements, evaluated for the presence of wall enhancement and thin-walled regions, against CFD metrics such as wall shear stress (WSS), and oscillatory shear index (OSI) are used to understand how the new imaging technique developed can predict the influence of hemodynamics on the deterioration of the aneurysmal wall, leading to rupture. Additionally, histology of each resected aneurysm, evaluated for inflammatory infiltration and wall thickness features, is used to validate the analysis from VWMRI and CFD. This data presents a solid foundation on which to build a new framework for combined VWMRI-CFD to predict unstable wall changes in unruptured intracranial aneurysms, and support clinical monitoring and intervention decisions.

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Date submitted: 01 Aug 2017 Electronic form version 1.4