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Assessment Of Coronary Artery Aneurysms Using Transluminal Attenuation Gradient And Computational Modeling In Kawasaki Disease Patients NOELIA GRANDE GUTIERREZ, Stanford University, ANDREW KAHN, UCSD, OLGA SHIRINSKY, NINA GAGARINA, GALINA LYSKINA, MSMU, RYUJI FUKAZAWA, SHUNICHI OWAGA, NME, JANE BURNS, UCSD, ALISON MARSDEN, Stanford University — Kawasaki Disease (KD) can result in coronary artery aneurysms (CAA) in up to 25% of patients, putting them at risk of thrombus formation, myocardial infarction and sudden death. Clinical guidelines recommend CAA diameter >8 mm as the arbitrary criterion for initiating systemic anticoagulation. KD patient specific modeling and flow simulations suggest that hemodynamic data can predict regions at increased risk of thrombosis. Transluminal Attenuation Gradient (TAG) is determined from the change in radiological attenuation per vessel length and has been proposed as a non-invasive method for characterizing coronary stenosis from CT Angiography. We hypothesized that CAA abnormal flow could be quantified using TAG. We computed hemodynamics for patient specific coronary models using a stabilized finite element method, coupled numerically to a lumped parameter network to model the heart and vascular boundary conditions. TAG was quantified in the major coronary arteries. We compared TAG for aneurysmal and normal arteries and we analyzed TAG correlation with hemodynamic and geometrical parameters. Our results suggest that TAG may provide hemodynamic data not available from anatomy alone. TAG represents a possible extension to standard CTA that could help to better evaluate the risk of thrombus formation in KD.

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