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Transluminal Attenuation Gradient for Thrombotic Risk Assessment in Kawasaki Disease Patients with Coronary Artery Aneurysms NOELIA GRANDE GUTIERREZ, ANDREW KAHN, JANE BURNS, ALISON MARSDEN, UC San Diego — Kawasaki Disease (KD) can result in coronary aneurysms in up to 25% of patients if not treated early putting patients at risk of thrombus formation, myocardial infarction and sudden death. Clinical guidelines for administering anti-coagulation therapy currently rely on anatomy alone. Previous studies including patient specific modeling and computer simulations in KD patients have suggested that hemodynamic data can predict regions susceptible to thrombus formation. In particular, high Particle Residence Time gradient (PRTg) regions have shown to correlate with regions of thrombus formation. Transluminal Attenuation Gradient (TAG) is determined from the change in radiological attenuation per vessel length. TAG has been used for characterizing coronary artery stenoses, however this approach has not yet been used in aneurysmal vessels. The aim of this study is to analyze the correlation between TAG and PRTg in KD patients with aneurysms and evaluate the use of TAG as an index to quantify thrombotic risk. Patient specific anatomic models for fluids simulations were constructed from CT angiographic image data from 3 KD aneurysm patients and one normal control. TAG values for the aneurysm patients were markedly lower than for the non-aneurysmal patient (mean -18.38 vs. -2). In addition, TAG values were compared to PRTg obtained for each patient. Thrombotic risk stratification for KD aneurysms may be improved by incorporating TAG and should be evaluated in future prospective studies.

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