Optical Coherence Tomography (OCT) in Patients with Regressed Coronary Aneurysm after Kawasaki Disease

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Background Kawasaki Disease (KD) is an acute self-limited vasculitis of childhood. Coronary artery aneurysms (CAAN) are a serious complication of KD, and can lead to ischemic heart disease, myocardial infarction and sudden cardiac death. Regression of CAAN occurs in 50% of the cases on follow up. Actual imaging techniques often describe these segments as normal, whereas studies have shown significant endothelial and smooth muscle dysfunction.

Method KD patients scheduled for routine coronary angiography underwent OCT imaging between March 2013 and August 2014. The aim of the study was to compare microstructural coronary changes in coronary artery segments with no history of CAAN to segments with regressed CAAN, and segments with persistent CAAN.

Results OCT was performed on 18 patients at 12.4 ± 5.5 years, 9.0 ± 5.1 years following onset of KD. Overall, 14/18 (77.7%) had a history of CAAN. Of those, 7/14 (50.0%) had regressed CAAN at time of OCT. Data was analyzed according to echocardiographic and angiographic progress of CAAN segments, with 18 segments having persistent CAAN, 11 regressed CAA and 13 with no history of segmental CAAN. All segments with persistent and regressed CAAN had significant intimal hyperplasia, compared to 1 with no history of segmental CAAN (p<0.001). The importance of the intimal hyperplasia also differs according to the coronary artery status, amounting 442.9 ± 176.7 μm for segments with persistent CAAN compared to 265.3 ± 115.9 μm for segments with regressed CAAN and 88.8 ± 93.3 μm for segments with no history of CAAN (p<0.001). Also, partial disappearance of the media was found significantly more often in segments with persistent and regressed CAA, compared to those with no history of CAA, in 15/18 (83.3%), 6/11 (54.5%) and 1/13 (7.7%) respectively (p<0.001).

Conclusion Despite normal angiographic features, regressed CAAN segments displayed significant microstructural changes, similarly to segments with persistent CAAN. The clinical signification of those changes is yet to be determined, but may present an increased risk of adverse coronary events. These findings demonstrate the potential incremental diagnostic value of OCT in the evaluation of patients following KD.