

[2588] Detection of Transplant Vasculopathy by Contrast-enhanced 64-Slice MDCT Coronary Angiography: Comparison to Invasive Coronary Angiography and Intravascular Ultrasound

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Introduction: Transplant recipients are exposed to the risks and discomforts of annual invasive coronary angiography and intravascular ultrasound (IVUS) to detect transplant vasculopathy, which is associated with intimal thickening and lumen loss. Multi-Detector Computed Tomography (MDCT) has been shown to non-invasively detect coronary plaque and measure vessel diameters. **Hypothesis:** MDCT will be comparable to invasive coronary angiography with IVUS for the detection of transplant vasculopathy. **Methods:** Fourteen heart transplant recipients [age 55 ± 13 years (mean \pm SD), 11 male, time since transplantation 73 ± 48 months] were studied with contrast-enhanced 64-slice MDCT angiography (Siemens Sensation 64) 7-30 days after invasive coronary angiography. All underwent IVUS of two coronary arteries (78 coronary segments). One observer evaluated MDCT images [axial, multiplanar reformatted and maximum intensity projection (MIP)] for the presence of transplant vasculopathy (defined as any wall thickening) in each coronary segment. An independent, blinded observer performed an identical analysis using IVUS (transplant vasculopathy defined as intima+media thickness >0.5 mm). Two independent, blinded observers measured vessel diameters in 8 predefined locations using MDCT MIP images and quantitative coronary angiography (QCA). **Results:** Evidence of transplant vasculopathy, as defined by IVUS, was common (45% of segments). Sensitivity, specificity, negative and positive predictive values of MDCT to detect transplant vasculopathy compared to IVUS were 60% (21/35), 86% (37/43), 78% (21/27) and 73% (37/51), respectively. Vessel diameter measurements were highly correlated ($R^2=0.89$). Bland-Altman analysis showed minimal bias of 0.1 ± 0.3 mm (MDCT 3.0 ± 0.9 mm vs. QCA 3.1 ± 0.9 mm). **Conclusions:** MDCT has $>70\%$ positive and negative predictive power for the detection of transplant vasculopathy, and provides accurate measurements of vessel diameters. This suggests that MDCT provides a non-invasive alternative to invasive coronary angiography with IVUS for evaluation of vasculopathy and lumen loss in heart transplant patients.

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