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Quantitative follow-up of cardiac allograft vasculopathy in heart transplanted patients using coronary CT angiography

Abstract: P2390

Quantitative follow-up of cardiac allograft vasculopathy in heart transplanted patients using coronary CT angiography

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Purpose: Cardiac allograft vasculopathy shows high inter-patient variations in heart transplanted (HTX) patients and has poor prognosis if diagnosed within few years after HTX. Coronary CT angiography (CTA) detects CAV with excellent accuracy. We sought to assess the feasibility of quantitative characterization and follow-up of CAV in HTX patients using coronary CTA.

Methods: 30 patients (21 males, age 55 [IQR: 50; 60] years) underwent 256-slice coronary CTA one year after HTX and an additional coronary CTA as part of the routine yearly follow-up at our institution. We quantified total vessel wall volume to assess CAV in all coronaries up to 2 mm luminal diameter using a semi-automated software, at the first year CTA and at the follow-up scan. Fixed threshold settings were used to assess various wall components: calcified (>350 HU), non-calcified (75–350 HU) and low-attenuation non-calcified tissue (<75 HU).

Results: Median follow-up was 414 [IQR: 376; 737] days. Total lumen volume did not change between baseline and follow-up studies, p=0.147. Total vessel wall volume showed 7.2% [IQR: 5.8; 10.2] growth, as overall vessel wall volume increased from 445 [IQR: 349; 604] to 534 [IQR: 390; 728] mm^3 (p<0.001). Non-calcified and low-attenuation non-calcified tissue volumes showed significant progression (393 [IQR: 250; 481] vs. 451 [IQR: 278; 575] mm^3, p=0.001 and 12 [IQR: 5; 22] vs. 21 [IQR: 7; 47] mm^3, p=0.002, respectively), while calcium volume did not change between baseline and follow-up CTAs (81 [IQR: 22; 131] vs. 68 [IQR: 21; 93] mm^3, p=0.229).

Conclusion: Quantitative follow-up of CAV is feasible with coronary CTA in HTX patients. CAV progression within the first years after HTX is mainly attributable to non-calcified tissue.