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Abstract 36: Stress Dynamic Computed Tomography Perfusion Versus Fractional Flow Reserve CT Derived In Suspected Coronary Artery Disease

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Introduction: Cardiac computed tomography angiography (cCTA) has become an established diagnostic test for ruling out coronary artery disease (CAD), but it does not allow assessment of hemodynamic relevance of stenotic lesions. Two recently introduced functional CT techniques are fractional flow reserve computed tomography derived (FFRct) and Dynamic Stress CT Perfusion (CTP). The aim of this study was to investigate the individual and combined accuracy of Dynamic Stress CTP and FFRct for the identification of functionally relevant CAD.

Methods: 85 patients (n: 67 men, mean age 65 years) with intermediate-to-high pretest likelihood of CAD, and planned for invasive coronary angiography (ICA) plus invasive FFR, underwent cCTA imaging and Dynamic stress CTP during adenosine vasodilation. FFRct was computed and a patient-specific myocardial blood flow index was calculated. Using binary regression, diagnostic performance of cCTA alone, cCTA + FFRct, cCTA + CTP or cCTA + FFRct + CTP were evaluated using C statistics versus invasive FFR, with a threshold of 0.80 as a reference.

Results: cCTA alone reached the highest sensitivity (83%) with significant improvement of specificity, positive predictive value and overall accuracy with both FFRct or CTP on top of cCTA. With binary logistic regression, the sequential strategy based with cCTA + FFRct + CTP reached the highest AUC for both vessel- based analysis (0.91) and patient-based analysis (0.91).

Conclusions: Stress dynamic CTP and FFRct both identify functionally significant CAD, with comparable accuracy. Diagnostic performance can be improved by combining the two techniques; a stepwise approach, reserving stress dynamic CTP for intermediate FFRct results, improves diagnostic performance while omitting the majority of the population from Dynamic Stress CTP examination.