Methods: This prospective study includes 60 patients (45 males, mean age 57±9 years) with angiographic evidence of MB on LAD and systolic compression ≥50% diameter stenosis. Patients were evaluated by stress-echocardiography test (SE) and conventional fractional flow reserve (FFR) and diastolic-FFR (d-FFR) in the distal segment of LAD during iv. infusion of dobutamine (DOB:10–40 µg/kg/min). Minimal luminal diameter (MLD) and percent diameter stenosis (%DS) of MB at end-systole and end-diastole were analyzed during dobutamine infusion using quantitative coronary angiography.
Results: Feasibility for determining FFR during DOB was 60/60 (100%). SE-test was positive in 19/60 (31.7%). Diastolic-FFR during peak DOB was significantly lower in SE-positive vs. SE-negative patients (0.70±0.07 vs. 0.79±0.06, p<0.001), but not for FFR (0.84+0.04 vs. 0.83+0.08, p=0.584). Both MLD at end-systole and end-diastole were significantly lower in SE-positive vs. SE-negative patients (MLD at end-systole: 0.41+0.31 vs. 0.68+0.30 mm, p=0.002; MLD at end-diastole: 1.29+0.25 vs. 1.79+0.30 mm, p<0.001). Both %DS at end-systole and end-diastole were significantly higher in SE-positive vs. SE-negative patients (%DS at end-systole: 83+12 vs. 74+11%, p=0.008; %DS at end-diastole: 46+6 vs. 31+7%, p<0.001). Diastolic-FFR correlated significantly with MLD and %DS at end-diastole (r=0.421, p<0.001; r=-0.416,p<0.001, respectively), but not with MLD and %DS at end-systole (r=0.245, p=0.062; r=-0.208, p=0.113, respectively). Multivariate regression analysis showed that d-FFR (OR 0.000007, 95% CI: 0.0000001–0.081, p=0.024) and %DS at end-diastole (OR 1.573, 95% CI: 1.160–2.133, p=0.004) were the independent predictors of stress-induced myocardial ischemia. ROC analysis identifies the optimal d-FFR during peak DOB cut-off <0.76 (AUC 0.93, 95% CI: 0.833–1.000, p<0.001) with a sensitivity and specificity of 95% and 95%, respectively, for detecting the presence of functional significant MB; and the optimal %DS cut-off >38% at end-diastole (AUC 0.95, 95% CI: 0.901–1.000, p<0.001) with a sensitivity and specificity of 100% and 83%, respectively, for detecting the presence of functional significant MB.
Conclusions: Diastolic-FFR and %DS of MB at and-diastole obtained during dobutamine infusion are excellent predictors of stress-induced myocardial ischemia in patient with MB.

P5511

Improving the diagnostic accuracy of quantitative flow ratio (QFR): a proposal of QFR-fractional flow reserve (FFR) hybrid approach

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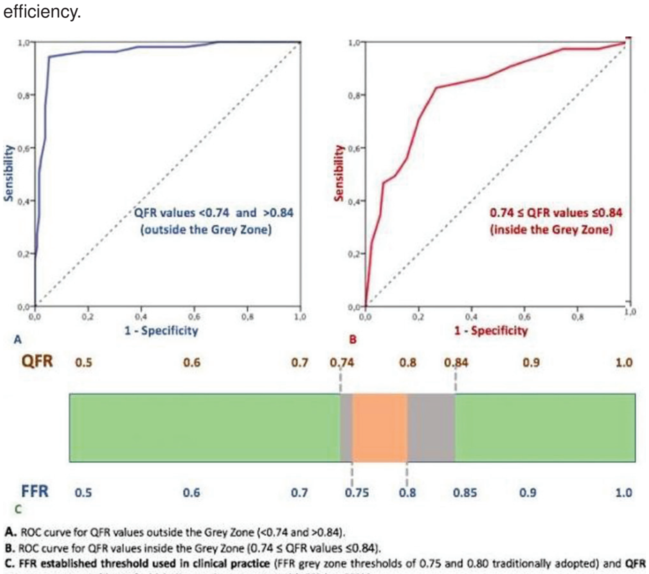
Aims: The overall diagnostic performance of QFR in identifying the FFR-based functional stenosis severity is good. However, its diagnostic accuracy may drop particularly when QFR values are close to the 0.80 FFR cut-off. We tested this hypothesis and investigated the value of QFR-FFR hybrid approach as a diagnostic strategy.
Methods: We enrolled patients who underwent FFR-guided coronary revascularisation as part of daily clinical practice. QFR was performed at a core laboratory by analyst blinded to FFR values. Receiver operating characteristics curves (ROC) were used to outline a grey zone within which a drop in diagnostic accuracy of QFR occurs, thus identifying upper and lower QFR boundaries with a diagnostic accuracy >95%. Area under the ROC curve (AUC) was used to estimate QFR efficiency.



QFR-FFR hybrid approach: the "grey zone"

Results: 404 vessels (336 patients) were analysed. Mean percent diameter stenosis (%DS), FFR and QFR were 51.8±11.5, 0.80±0.10 and 0.79±0.11, respectively. The LAD coronary artery was the most interrogated vessel (240; 59%). Overall, a high diagnostic performance of QFR was observed (AUC 0.929 [CI 95%, 0.903–0.954]; diagnostic accuracy=88%). ROC analysis identified 0.74 and 0.84 as QFR boundaries outlining the grey zone with QFR accuracy <95%. Inside that grey zone (165 vessels [41%]) the accuracy and efficiency of QFR was low (AUC 0.818 (CI 95%, 0.752–0.883), agreement 78%). Out of that QFR grey zone (≤0.73 and ≥0.85; 239 vessels [59%]) the accuracy and efficiency of QFR was very high (AUC 0.959 (CI 95%, 0.933–0.985), agreement 95%) (p=0.0001 for comparison of accuracy).
Conclusions: A hybrid diagnostic strategy in which QFR alone is used to make decisions whenever <0.74 or >0.84 and FFR use is restricted to the QFR grey zone, results in excellent diagnostic performance (>95% agreement), while reducing the need of pressure guidewires to only 41% of cases.

P5512

Can we use frequency domain optical coherence tomography to evaluate left main coronary artery disease?

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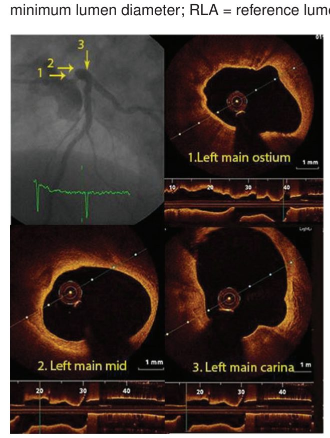
Background: Frequency Domain Optical Coherence Tomography (OCT) is a relatively new imaging modality with very high resolution, however it is not considered suitable for assessment left main coronary artery (LM) disease. LM is a large vessel with proximal location in which the complete blood displacement necessary for OCT imaging may be challenging especially in the ostial segment.
Purpose: To assess the safety and feasibility of OCT to evaluate LM stenosis including ostial lesions.
Methods: Eighty six patients with intermediate LM stenosis angiographically underwent OCT imaging. Angiography was used to divide the LM into 2 segments: 1) ostial (proximal 1/3 of the LM) and 2) non-ostial (distal 2/3 of the LM). The LM ostial segment was considered visible by OCT if the LM length measured by OCT and angiography were equal. The following parameters were measured by OCT in the LM: reference lumen area and diameter, minimum lumen area and diameter and length.
Results: During flushing, 4/86 (5%) patients described chest pain; and 3/86 (3%) patients had transient ST segment depression. Non-ostial segment of the LM was visible and measurable by OCT in all 86/86 (100%) patients, however ostial segment was visible and measurable only in 40/86 (46,5%) patients. We divided the study population into 2 groups according LM ostium visibility by OCT (Table). The group with visible LM ostium had smaller size of the LM in angiography and higher incidence of LM ostial lesion.

LM angiograpchic and OCT measurements

	LM ostium visible by OCT n=40 patients	LM ostium non-visible by OCT n=46 patients	p value
Angiographic length (mm)	12,37±5,01	15,79±5,73	0.00
Angiographic RLD (mm)	3,62±0,77	4,05±0,67	0,00
Angiographic MLD (mm)	2,04±0,54	2,29±0,62	0,05
Angiographic ostial stenosis present n (%)	19 (47,5)	8 (17,3)	0,00
OCT length (mm)	12,22±4,99	12,29±4,70	0,94
OCT RLA (mm^2)	12,73±3,58	13,50±4,66	0,40
OCT MLA (mm^2)	5,70±3,21	6,90±2.34	0,05
OCT RLD (mm)	3,95±0,61	4,03±0,68	0,56
OCT MLD (mm)	2,45±0,70	2,84±0,57	0,00

OCT = optical coherence tomography; LM = left main; RLD = reference lumen diameter; MLD = minimum lumen diameter; RLA = reference lumen area; MLA = minimum lumen area.



Left main angiography and OCT imaging

Conclusions: OCT imaging of the LM is safe and feasible. However, LM ostium is visible only in half of the cases. Angiographically smaller LM size and presence of LM ostial stenosis facilitate OCT imaging.