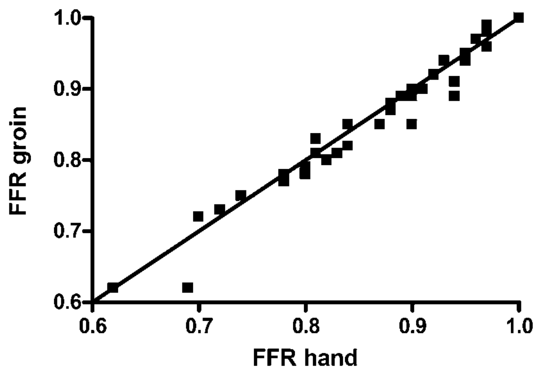
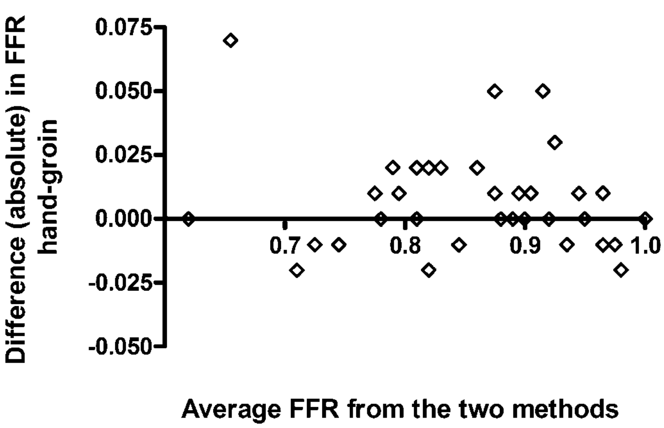
figures 1 and 2 below. Abstract 020 figure 1 shows FFR using hand vein for adenosine vs FFR using femoral (groin) vein for adenosine—paired data are shown as (x, y) points. The line of unity is shown for a theoretical perfect agreement between the measures. Abstract 020 figure 2 shows a Bland Altman plot of FFR derived from hand vs groin adenosine infusions.



Abstract 020 Figure 1



Abstract 020 Figure 2

The mean difference between the two measures of FFR was 0.007 with a SD of 0.020. The 95% limit of agreement extended from −0.031 to +0.046. Using a threshold for ischaemia of FFR ≤0.75, there were no cases in which use of hand vein adenosine would have misclassified a lesion compared to the "gold standard" central vein adenosine. Using a threshold for ischaemia of FFR ≤0.80, there was one case which would have been classified differently. Time to maximal hyperaemia was significantly greater with hand vein adenosine infusion. (75.7±32.8 s vs 40.5±10.3 s, p<0.001 on t test).

Conclusion The use of hand vein adenosine infusion produced very similar values of minimum FFR to those using femoral vein adenosine. These data have important practical implications for patients undergoing transradial procedures who require FFR assessment.

021 COMPUTER MODELLED CORONARY PHYSIOLOGY AND "VIRTUAL" FRACTIONAL FLOW RESERVE FROM ROTATIONAL ANGIOGRAPHY

doi:10.1136/heartjnl-2012-301877b.21

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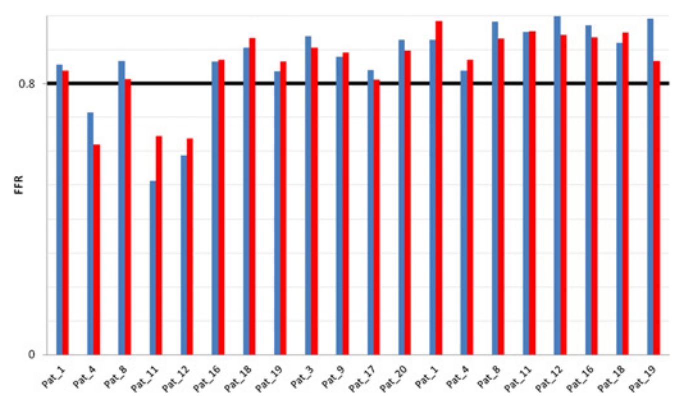
Background Percutaneous coronary intervention (PCI) guided by fractional flow reserve (FFR) measurement is superior to visual angiographic assessment alone. We have developed a workflow that takes a single rotational angiogram (RoCA), reconstructs the 3-dimensional arterial tree and applies computational fluid dynamics (CFD) to calculate the FFR without the need to induce hyperaemia or perform invasive pressure measurements.

Methods 20 patients, scheduled for elective PCI underwent RoCA. The FFR was measured with a Combowire (Volcano), under resting and hyperaemic conditions. Physiologically significant lesions were stented and the measurements repeated. The arterial anatomy was reconstructed on a Philips 3DCA workstation. Generic boundary conditions for CFD were derived from the measured data. The calculated ("virtual") and measured FFR values were then compared.

Results There were 11 right coronary artery (RCA) cases (6 stented) and 12 left coronary artery (LCA) cases (8 stented). The anatomy was reconstructed, and the FFR computed in each case (pre- and post-stenting). The CFD model accurately predicted which lesions were physiologically significant (FFR <0.8) and which were not (FFR >0.8) in all cases. The virtual FFR values deviated from the measured by ±6% (SD=6%) for both RCA and LCA cases.

Conclusion We have developed a novel, user-friendly workflow, which has the potential to predict FFR without the need for invasive measurements or inducing hyperaemic conditions. Our model identified lesions requiring intervention in all cases. Further work will optimise and refine the model by better characterising the downstream generic boundary conditions. We aim to improve the accuracy of the optimised model with more complex patients and lesions.



Abstract 021 Figure 1 Graph demonstrates measured FFR (blue) vs calculated FFR (red) for LCA cases (8 pre- and post-stent cases and 4 non-stented cases).

022 DYNAMIC THREE-DIMENSIONAL WHOLE HEART MAGNETIC RESONANCE MYOCARDIAL PERFUSION IMAGING: VALIDATION AGAINST PRESSURE WIRE DERIVED FRACTIONAL FLOW RESERVE FOR THE DETECTION OF FLOW-LIMITING CORONARY HEART DISEASE

doi:10.1136/heartjnl-2012-301877b.22

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Background Three-dimensional (3D) myocardial perfusion cardiovascular magnetic resonance (CMR) has recently been proposed to overcome the limited spatial coverage of conventional perfusion CMR methods. The method has shown good diagnostic accuracy for the detection of coronary artery disease determined by quantitative coronary angiography. However the relationship between the severity of a coronary stenosis on quantitative coronary angiography and its functional significance is variable. Pressure wire-derived fractional flow reserve (FFR) <0.75 correlates closely with objective evidence of reversible ischaemia and it has been demonstrated that ischaemia-guided PCI confers a prognostic benefit.