IMR. The novel MPR criterion of 1.5, to detect high IMR>40, can confirm the clinical diagnosis of microvascular ischaemia, enabling targeted therapy and disease monitoring.

114 DETECTING ISCHAEMIA IN FLOW LIMITING MULTI-VESSEL DISEASE – IS 3D PERFUSION CMR WHERE THE MONEY LIES?

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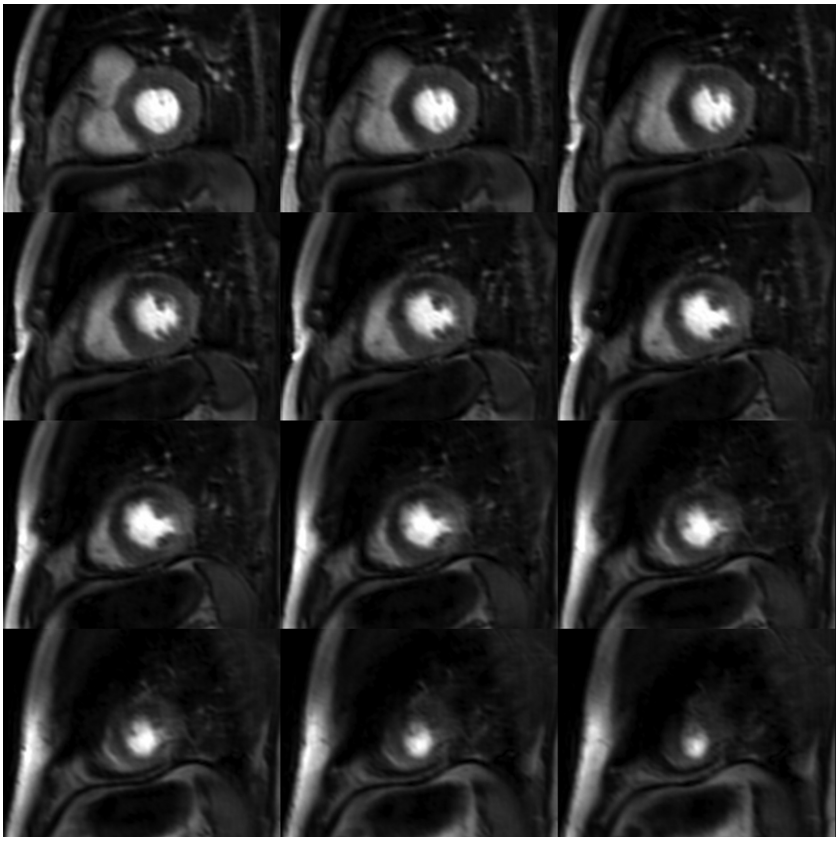
10.1136/heartjnl-2017-311726.113

Introduction Myocardial perfusion cardiovascular magnetic resonance (CMR) is a highly accurate non-invasive imaging modality in the diagnosis of coronary artery disease (CAD). High-resolution (hi-res) two-dimensional (2D) perfusion CMR can better detect sub-endocardial ischaemia although with the disadvantage of lesser myocardial coverage. Three-dimensional (3D) perfusion provides whole heart coverage but has a comparatively inferior resolution. The superiority of fractional flow reserve (FFR) over visual angiographic assessment in determining functional significance of a coronary stenosis is now well established. We studied the diagnostic agreement between hi-res 2D and 3D perfusion CMR in patients with significant multi-vessel flow limiting CAD as confirmed by FFR on a per patient and per vessel basis.

Methods Patients with suspected stable CAD referred for invasive coronary angiography as part of their routine clinical care were prospectively recruited. Prior to revascularisation (if performed) all patients underwent both hi-res 2D adenosine vasodilator stress and 3D adenosine stress perfusion scans during the same sitting. Visually, coronary stenoses less than 50% were deemed not to be flow limiting, whereas those 80% or more were considered as flow limiting. For stenoses between 50%–80% FFR study was performed, with FFR of 0.8 or less considered functionally significant. Blinded, independent, qualitative visual analysis by two experienced readers was performed to confirm existence of true perfusion defects on both 2D and 3D perfusion CMR datasets. Vascular territories in relation to CMR perfusion defects were assigned as per AHA 16 segment classification.

Results Prevalence of CAD was 62%. Of the 29 patients studied, 6 (21%) had single-vessel disease, 8 (27%) had two-vessel disease (2VD), 4 (14%) had three-vessel disease (3VD), and 11 (38%) had no significant CAD. In view of the small sample size qualitative analysis was undertaken to determine concordance between hi-res 2D and 3D perfusion CMR. Prevalence of perfusion defects relating to the three vascular territories have been detailed in Table 1.

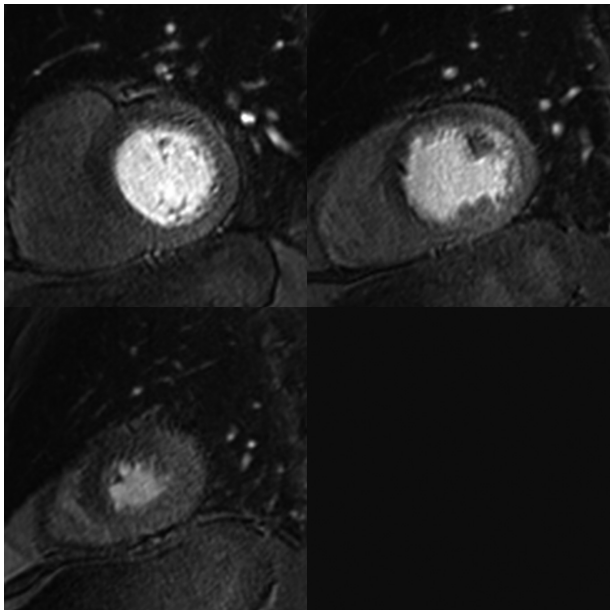
Conclusions Our study shows an excellent agreement for both modalities in detecting FFR positive CAD on a per patient basis. On a per vessel basis, between the two, agreement in



Abstract 114 Figure 1 3D perfusion images showing perfusion defects in LAD (see blue arrows) and circumflex territory (see red arrows)

Abstract 114 Table 1

Patients with MVD n=12			LAD		LCX		RCA	
			3D WH CMR	2D HiRes CMR	3D WH CMR	2D HiRes CMR	3D WH CMR	2D HiRes CMR
Flow limiting disease with perfusion defects	FFR positive	CMR positive	12	11	5	3	9	8
Flow limiting disease but no perfusion defects	FFR positive	CMR negative	0	1	2	4	2	3
Perfusion defects but no flow limiting disease	FFR negative	CMR positive	0	0	3	1	0	0
No flow limiting disease and no perfusion defects	FFR negative	CMR negative	0	0	2	4	1	1



Abstract 114 Figure 2 High resolution 2D perfusion images in the same patient showing perfusion defects in the LAD territory only (see blue arrows)

the LAD territory appears to be best. Discrepancy appears to be most in the circumflex territory. 3D perfusion CMR appears to detect circumflex ischaemia more accurately possibly due to better coverage of the basal left ventricle. (Ref Fig 1 and Fig 2) The lateral wall is often the thinnest making it more difficult to detect perfusion abnormalities – better coverage with 3D may be beneficial here. However, in the circumflex vascular territory we also observe that, in the absence of flow limiting disease in the circumflex artery (comparatively with the LAD and RCA) perfusion defects appear to be more prevalent, reflecting a limitation of the AHA classification.

115 DIAGNOSTIC CONCORDANCE AND CLINICAL OUTCOMES IN PATIENTS UNDERGOING FRACTIONAL FLOW RESERVE AND STRESS ECHOCARDIOGRAPHY FOR THE ASSESSMENT OF CORONARY STENOSIS OF INTERMEDIATE SEVERITY

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10.1136/heartjnl-2017-311726.114

Introduction The ischaemic consequences of a coronary artery stenosis can be assessed by invasive fractional flow reserve (FFR) or by non-invasive imaging. We sought to determine (i) the concordance between wall thickening assessment and FFR during clinically indicated stress echocardiography (SE) and FFR measurements and (ii) the predictors of hard events in these patients.

Methods and Results 194 patients who underwent SE and invasive FFR measurements in close succession were analysed for diagnostic concordance and clinical outcomes. At the vessel level, the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of SE for identifying significant disease as assessed by FFR was 70%, 78%, 46% and 91% respectively. In patients with single vessel disease, the sensitivity, specificity, PPV and NPV were 86%, 66%, 38% and 95% respectively. The greatest discordance was seen in patients with wall thickening abnormalities (WTA) and negative FFR. During a follow up of 3.0±1.9 years there were 15 cardiovascular (CV) events. The number of wall segments with inducible WTAs emerged as the only independent predictor of CV events (HR 1.22 (1.05–1.43), p=0.01). FFR was not a predictor of outcome. There was a significant increase in event rate in patients with WTA/negative FFR and WTA/positive FFR, compared to patients with no WTA (p=0.04). However, no significant difference was seen between patients with WTA/negative FFR versus WTA/positive FFR (p=0.38)