Background The success of emergency coronary reperfusion therapy in ST-elevation myocardial infarction (STEMI) is commonly limited by failed tissue perfusion.

Purpose To assess the clinical significance of myocardial haemorrhage using cardiac magnetic resonance (CMR) in survivors of acute STEMI and assess the temporal evolution of intramyocardial haemorrhage (IMH) versus microvascular obstruction (MVO) in a serial imaging subset.

Methods 286 reperfused STEMI patients underwent CMR 2-days and 6-months post-MI. IMH was taken to represent a hypointense infarct core with a T2* value <20 ms. 30 STEMI patients underwent serial CMR at 4 time points: 4–12 h, 3-days, 10-days and 6–7 months post reperfusion. Cardiovascular death or heart failure hospitalisation (CVD/HF) was independently assessed during follow-up.

Results 245 STEMI patients had evaluable T2* data and 101 (41%) patients had IMH. 133 (51%) patients had MVO. All of the patients with IMH had MVO. IMH was multivariably associated with adverse remodelling, independent of baseline LVEDV (OR (95% CI): 2.64 (1.07, 6.49); $p = 0.035$). IMH was also multivariably associated with CVD/HF post-discharge (HR (95% CI): 12.9 (1.6, 100.8); $p = 0.015$).

In the serial imaging subgroup, IMH occurred in 7(23%), 13(43%), 11(33%), and 4(13%) patients at 4–12 h, 3-days, 10-days and 7-months, respectively. The amount of MVO was greatest 4–12 h post-reperfusion, then fell progressively over time. In contrast, the amount of IMH increased dynamically from 4–12 h with a peak at 3 days. MVO resolved by day 10 in 8 patients (44%), 2 (25%) of whom had IMH. Whereas MVO persisted in 10 patients (56%), all (100%) of whom had IMH.

Conclusion IMH is independently associated with adverse remodelling and ACD/HF post-discharge. T2* imaging differentiates persistent, structural microvascular destruction from functional, potentially reversible MVO. IMH is a biomarker with potential to reflect the efficacy of therapeutic interventions in STEMI patients.

9 SEX DIFFERENCES IN CIRCUMFERENTIAL AND LONGITUDINAL STRAIN ASSESSED USING STRAIN ENCODED CARDIAC MAGNETIC RESONANCE AT 3.0T

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Background Displacement encoding with stimulated echoes (DENSE) encodes myocardial tissue displacement into the phase of the MRI image, thus allowing direct quantification of myocardial displacement at multiple cardiac phases. Strain-encoded CMR with DENSE has high spatial (3.2 mm × 3.2 mm × 8 mm) and temporal resolution (TR= 27.34 ms). We aimed to measure myocardial strain values with DENSE in healthy adults across a broad age range at 3.0 Tesla.

Methods Healthy volunteers with no prior medical history or treatment were enrolled and underwent CMR at 3.0T (Magnetom Verio, Siemens healthcare, Erlangen, Germany). Mid-left ventricular short axis and horizontal long axis DENSE sequences were acquired and analysed using CIM_DENSE2D software

(University of Auckland, New Zealand and Siemens Healthcare). Segmental and global myocardial circumferential (Ecc) and longitudinal (Ell) strain were obtained.

Results Ecc and Ell were analysed in 77 volunteers (mean age 45 ± 18 years, 49% male) (Table 1). Mean Ecc strain was greater in women than in men. These sex-differences were mainly related to strain values in the anterior and antero-lateral LV segments. There is no difference for Ell.

Conclusion Left ventricular circumferential contractility differs between men and women, and the differences were regionalised to the antero-lateral myocardial regions where LV displacement is greatest.

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Abstract 9 Table 1 Gender differences in Circumferential and Longitudinal Strain at 3T

	Men	Women	p-value
Ecc (%)*	(n = 38)	(n = 39)	
Mean	18.19 ± 1.5	19.42 ± 2.8	0.020
Anterior	19.03 ± 3.4	21.29 ± 3.7	0.008
Antero-septal	17.13 ± 2.9	18.05 ± 3.7	0.235
Infero-septal	15.43 ± 2.9	16.48 ± 3.7	0.178
Inferior	19.56 ± 3.2	20.57 ± 4.2	0.241
Infero-lateral	21.06 ± 3.1	21.33 ± 4.2	0.760
Antero-lateral	19.56 ± 3.0	21.66 ± 3.9	0.01
Ell (%)*			
Mean	10.53 ± 2.4	11.66 ± 2.6	0.052
Basal-septal	8.79 ± 4.10	10.54 ± 4.6	0.083
Mid-septal	12.20 ± 3.6	11.83 ± 4.4	0.687
Apico-septal	14.53 ± 5.0	16.98 ± 4.2	0.024
Basal-lateral	12.83 ± 4.5	15.29 ± 4.7	0.021
Mid-lateral	12.55 ± 4.1	12.56 ± 4.3	0.992
Apico-lateral	13.55 ± 4.3	13.40 ± 4.4	0.801

*Values expressed as mean ± standard deviation

10 SEX DIFFERENCES IN CIRCUMFERENTIAL AND LONGITUDINAL STRAIN REVEALED BY STRAIN-ENCODED CARDIAC MAGNETIC RESONANCE IN HEALTHY VOLUNTEERS AT 1.5T

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10.1136/heartjnl-2015-307845.10

Background Displacement encoding with stimulated echoes (DENSE) encodes myocardial tissue displacement into the phase of the MRI image, thus allowing direct quantification of myocardial displacement at multiple cardiac phases. Strain-encoded CMR with DENSE has high spatial (3.2 × 3.2 × 8 mm) and temporal resolution (32.5 ms phase). We aimed to measure myocardial strain values with DENSE in healthy adults across a broad age range at 1.5 Tesla.

Methods Healthy volunteers with no prior medical history (including cardiovascular health problems or medication) were enrolled and underwent CMR at 1.5T (Magnetom Avanto, Siemens Healthcare, Erlangen, Germany). Mid-left ventricular short axis and horizontal long axis DENSE sequences were