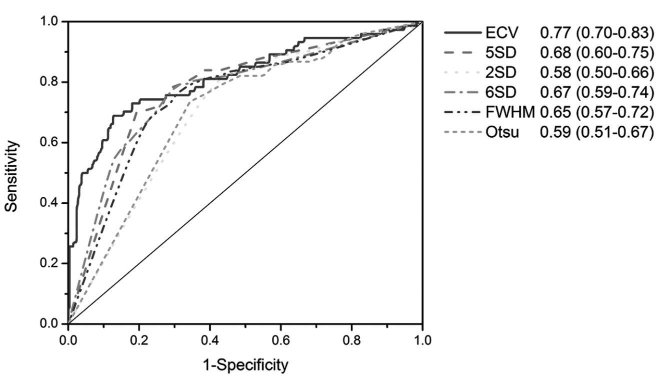
Reduced convalescent wall motion score correlated with acute ECV ($p < 0.01$), and acute LGE for 5 SD ($p < 0.01$), 6 SD ($p < 0.01$) and FWHM ($p = 0.01$), but not 2 SD ($p = 0.2$) or Otsu ($p = 0.6$). Acute infarct ECV demonstrated a significantly higher c-statistic for prediction of improved segmental convalescent wall motion score than all threshold measures of acute transmural LGE extent ($p \leq 0.02$ for all, Figure 1).

Acute infarct ECV outperforms threshold-based LGE transmural extent to predict segmental LV functional recovery in reperfused AMI.

Abstract 20 Table 1 Infarct characteristics

Characteristic	Acute visit	Convalescent visit	P value
Ejection fraction,%	48 ± 9	58 ± 7	<0.01
LV EDVi*, ml/m²	81 ± 16	85 ± 21	ns
LV ESVi†, ml/m²	41 ± 12	36 ± 13	<0.01
LGE transmural extent, %	79 ± 12	61 ± 16	<0.01
LGE infarct volume, ml	16 ± 11	10 ± 8	<0.01
LGE MO volume, ml	2 ± 2		
Area at risk, ml	41 ± 17		
Myocardial salvage index	0.55 ± 0.25		
Infarct native T1	1333 ± 110	1244 ± 124	<0.01
Remote native T1	1189 ± 71	1146 ± 72	ns
Infarct ECV	0.56 ± 0.14	0.57 ± 0.19	ns
Remote ECV	0.30 ± 0.06	0.29 ± 0.06	ns

Data as mean ± SD. **LV EDVi* Left ventricular end diastolic volume, indexed to body surface area, †*LV ESVi* Left ventricular end systolic volume, indexed to body surface area. LGE measurements made with visual analysis



Abstract 20 Figure 1 Receiver operator characteristic (ROC) curve comparing infarct ECV and LGE thresholds in dysfunctional segments (n = 163) with improvement in wall motion score at 90 days. Remote segments not shown. C-statistic and 95% confidence intervals are shown in the legend for each method. ECV had a significantly higher c-statistic than all threshold-based measures ($p \leq 0.02$ for all).

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21 LEFT ATRIAL REMODELLING FOLLOWING TREATMENT OF SYMPTOMATIC SEVERE AORTIC STENOSIS

[1]TA Musa, [1]A Uddin, [1]TA Fairbairn, [1]LE Dobson, [2]C Steadman, [1]A Kidambi, [1]M Motwani, [1]DP Ripley, [1]AK McDiarmid, [1]P Swoboda, [1]B Erhayiem, [1]P Garg, [1]S Sourbron, [1]S Plein, [2]G McCann, [1]JP Greenwood. *[1]LICAMM & MCRC, University of Leeds, UK; [2]NIHR BRU, University of Leicester, UK*

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Background Left atrial (LA) size is an adverse prognostic marker. Aortic stenosis results in increased filling pressures with progressive left atrial enlargement and dysfunction. Intervention for aortic stenosis results in LV reverse remodelling, however the effect of TAVI or SAVR upon LA function remains poorly understood and the two treatments have not been directly compared.
Aim We assessed LA size and function in patients with severe symptomatic aortic stenosis before and 6 months TAVI and SAVR.
Methods All patients underwent an identical 1.5T CMR protocol and were in sinus rhythm at time of imaging. LA volumes were derived using the biplane area–length method (Figure 1). The total LA emptying fraction was derived as: (LAVmax–LAVmin)*100/LAVmax.
Results 23 SAVR patients (age 72.7 ± 7.5 years, 83% male, EuroSCORE II 1.40 ± 1.11%) and 23 TAVI patients (age 80.7 ± 6.9 years, 57% male, EuroSCORE II 4.99 ± 2.97%). The left atria of the TAVI group were significantly more dilated at baseline than those of the SAVR group ($p = 0.039$) however both groups were comparable at 6 months ($p = 0.227$). Similarly, the LA emptying fraction of the TAVI group was significantly lower than the SAVR group at baseline ($p = 0.003$) with comparable function seen at 6 months ($p = 0.08$) (Table 1).

Abstract 21 Table 1 LA volumes and emptying fraction before and after TAVI and SAVR

TAVI	Baseline	6 months	p Value
Maximum LA volume (mls/m²)	63.3 ± 17.0	52.8 ± 14.0	0.001
Total LA emptying fraction (%)	36.9 ± 12.6	43.4 ± 10.4	0.011
SAVR	**Baseline**	**6 months**	**p Value**
Maximum LA volume (mls/m²)	53.2 ± 15.1	48.2 ± 11.7	0.09
Total LA emptying fraction (%)	48.5 ± 12.8	48.7 ± 9.1	0.945

Conclusions TAVI, but not SAVR, was associated with a significant reduction in LA volume and concomitant improvement in emptying fraction at 6 months. These preliminary findings may reflect worse LA function at baseline in the TAVI group or improved valvular haemodynamics with TAVI compared to SAVR.

22 SURGICAL AORTIC VALVE REPLACEMENT (SAVR) UPON RIGHT VENTRICULAR FUNCTION: A CARDIAC MRI STUDY

[1]TA Musa, [1]A Uddin, [1]TA Fairbairn, [1]LE Dobson, [2]C Steadman, [1]A Kidambi, [1]M Motwani, [1]DP Ripley, [1]AK McDiarmid, [1]P Swoboda, [1]B Erhayiem, [1]P Garg, [1]S Sourbron, [1]S Plein, [2]G McCann, [1]JP Greenwood. *[1]LICAMM & MCRC, University of Leeds, UK; [2]NIHR BRU, University of Leicester, UK*

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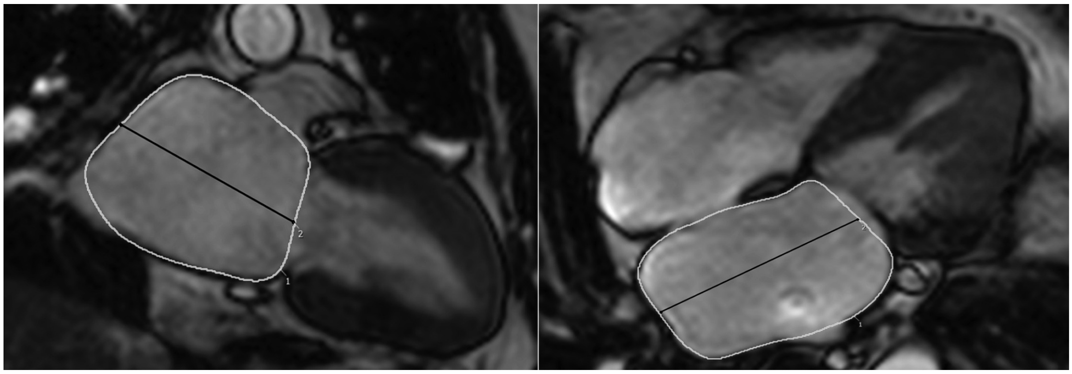
Background Right ventricular function is of prognostic importance in a variety of clinical settings but its complex anatomic geometry can pose a challenge to 2-dimensional imaging modalities. Right ventricular dysfunction is thought to occur following cardiac surgery and independently predicts adverse outcomes. However a clear mechanism for this dysfunction remains undefined.
Aim To accurately assess the effect of SAVR upon right ventricular function in patients treated for severe symptomatic aortic stenosis.
Methods All patients underwent an identical 1.5T CMR protocol before and 6 months after surgery (Intera, Phillips Healthcare, Best, The Netherlands or Avanto, Siemens Medical Systems, Erlangen, Germany).



Abstract 21 Figure 1 Measurement of left atrial (LA) volume by the biplane area–length method where A2Ch and A4Ch refer to the LA area in the two-chamber and four-chamber views, respectively, and L is the shorter of the two LA length measurements (L2Ch, L4Ch) from these views.

$$LAV = 8(A2Ch)\ (A4Ch)/3\pi L$$

Results 53 SAVR patients (age 72.7 ± 7.4 years, 72% male, mean EuroSCORE II 1.52 ± 0.95%) were studied. Six received a metallic prosthesis and the remaining 47 (89%) a tissue bioprosthesis. Fourteen (26%) received concomitant coronary bypass grafting, of which 6 involved use of the left internal mammary artery. For the group as a whole, the average bypass time was 105 ± 48 min and average cross clamp time 77 ± 41 min. The average length of stay in intensive care was 3.4 ± 2.4 days. SAVR was associated with a significant decrease in RV ejection fraction and concomitant increase in indexed RVESV at 6 months, with no change in RV mass (Table 1). However, in subgroup analysis of patients without LGE of the left ventricle at baseline, no significant change in RV function was seen following SAVR (p = 0.06).

Abstract 22 Table 1 RV changes following SAVR

RV	Baseline	6 months	p Value
EDVI (ml/m^2)	78 ± 17	78 ± 16	0.90
ESVI (ml/m^2)	33 ± 10	37 ± 10	<0.01
EF (%)	58 ± 8	53 ± 9	<0.01
Mass Index (g/m^2)	16 ± 4	15 ± 4	0.15

Conclusions SAVR is associated with a significant reduction in right ventricular ejection fraction at 6 months mediated through an increase in end systolic volume. The presence of LGE may have the potential to identify patients at risk of post-operative RV dysfunction.

23 LONGITUDINAL BUT NOT CIRCUMFERENTIAL STRAIN IS ASSOCIATED WITH HEALTHY AGEING: A STRAIN-ENCODED CARDIAC MAGNETIC RESONANCE IMAGING STUDY AT 3.0TESLA

[1,2]Kenneth Mangion, [1]Guillaume Clerfond, [1,2]David Carrick, [1]John McClure, [1]Samuli M Rauhalammi, [1,2]David Corcoran, [3]Christie McComb, [1]Aleksandra Radjenovic, [1,2]Colin Berry. [1]*BHF Glasgow Cardiovascular Research Centre, University of Glasgow, UK;* [2]*West of Scotland Heart and Lung Centre, Golden Jubilee National Hospital, Clydebank, UK;* [3]*Clinical Physics, NHS Greater Glasgow and Clyde, Glasgow, UK*

10.1136/heartjnl-2015-307845.23

Background Displacement encoding with stimulated echoes (DENSE) encodes myocardial tissue displacement into the phase of the MRI image permitting 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 3.0Tesla.

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

Results 77 participants (mean (SD) age 43.0(16.9) years; range 18–78 years; 40 (52%) males;) were grouped into 3 tertiles according to age. Longitudinal strain differed according to age tertile with strain being greatest in individuals 35–55 years compared to younger or older subjects. There were no differences in Ecc according to age per tertile (Table 1).

Abstract 23 Table 1 Age differences in peak circumferential (Ecc) and peak longitudinal (Ell) strain in healthy volunteers at 3.0T

	<35 years	35–55 years	>55 years	ANOVA P-value
Ecc**	N = 32	N = 25	N = 20	
Mean	18.63 ± 2.2	19.51 ± 2.3	18.23 ± 2.6	0.165
Anterior	19.35 ± 3.9	21.01 ± 3.6	20.31 ± 2.8	0.216
Antero-septal	17.25 ± 3.0	18.20 ± 2.6	18.18 ± 3.7	0.506
Infero-septal	16.30 ± 3.0	16.75 ± 3.4	14.83 ± 3.9	0.170
Inferior	20.46 ± 3.7	20.93 ± 3.5	19.29 ± 3.7	0.353
Infero-lateral	21.29 ± 3.4	21.58 ± 3.6	20.97 ± 4.6	0.877
Antero-lateral	19.83 ± 3.9	21.89 ± 3.7	20.18 ± 2.8	0.105
Ell (ms)**	N = 28	N = 26	N = 23	
Mean	11.12 ± 2.3§	12.50 ± 2.0*	9.54 ± 2.6^	<0.001
Basal-septal	9.60 ± 5.3	11.10 ± 3.8	8.25 ± 3.6	0.079
Mid-septal	12.35 ± 3.6	13.20 ± 2.9*	10.23 ± 5.1	0.028
Apico-septal	15.15 ± 3.9§	17.91 ± 3.6*	14.23 ± 6.0	0.015
Basal-lateral	13.93 ± 4.9	13.18 ± 4.9	14.67 ± 4.5	0.796
Mid-lateral	12.75 ± 4.0	14.13 ± 4.2*	10.52 ± 4.6	0.008
Apico-lateral	13.86 ± 3.7	13.82 ± 4.2	12.44 ± 5.2	0.437

**expressed as mean, standard deviation
§significant difference ($p < 0.05$) between 1st and 2nd tertile
*significant difference ($p < 0.05$) between 2nd and 3rd tertile
^significant difference ($p < 0.05$) between 3rd and 1st tertile