Indexed Left Atrial Volume Predicts Adverse Outcomes Independent of the Severity of Ischaemic Mitral Regurgitation – A Cohort Study of 1000 Patients Following Acute Myocardial Infarction

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Background Ischaemic mitral regurgitation (IMR) is associated with left atrial (LA) dilatation. In patients with primary MR, LA enlargement is an independent predictor of mortality following medical management and mitral valve surgery. The prognostic significance of LA dilatation in IMR post-myocardial infarction (MI) has not been studied.

Purpose To determine the impact of LA dilatation on mortality in patients with IMR.

Methods 1000 consecutive patients admitted to the Queen Elizabeth Hospital Birmingham with MI who underwent percutaneous coronary intervention were included. Early inpatient TTE was performed within 24-48 hours by accredited echocardiographers using standard multiparametric quantification of IMR, including proximal isovelocity surface area (PISA), effective regurgitant orifice (EROA), vena contracta (VC), and regurgitant volume (RVol). LA size was measured by the recommended biplane method for calculation of LA volume and indexed to body surface area (Mosteller). Analysis was performed on patients with indexed LA volume (LAVi) above and below 34ml/m2 (defined as the upper limit of normal in European Cardiovascular Imaging guidelines).

Results LAVi was observed in 294/1000 patients (29.4%) post-MI, graded as mild (76%), moderate (21%) and severe (3%). A total of 275/294 (94%) had complete chamber volume data.

LA dilatation (LAVi > 34ml/m2) was seen in 124 (45%) patients while 151/275 (55%) had normal LA volume (LAVi <34ml/m2). Patients with LA dilatation had more severe MR by multiparametric categorisation (mild 60%, moderate 34%, severe 7%) than those with normal LA volume (mild 87%, moderate 13%, severe 0.6%). Those with larger LAVi also had more severe MR based on individual quantification, as determined by larger mean PISA (0.63+/−0.21 vs 0.48+/−0.18; p <0.0001), EROA (0.24+/−0.13 vs 0.18+/−0.16; p=0.0009), VC (0.56+/−0.21 vs 0.45+/−0.17; p <0.0001) and RVol (40+/−25 vs 30+/−24; p=0.0008).

Although patients with LAVi > 34ml/m2 were older (76+/−11 years vs 70+/−12; p <0.0001), they were less likely to have had an ST-elevation MI (35% vs 51%; p <0.01) and had smaller peak high sensitivity troponin [650ng/L (IQR 127-2991) vs 1176ng/L (IQR 208-3705)]. Despite the smaller infarct size and similar LVEF between groups (48+/−15% vs 48+/−14%), all-cause mortality was significantly higher amongst those patients with IMR who had LA dilatation (27.4% vs 13.3%; p <0.01). After a mean follow up of 3.2 years, overall mortality amongst all patients with IMR was 19% (54/294) and patients with LAVi > 34ml/m2 accounted for 60% of this mortality.

Conclusion IMR patients with LA dilatation have significantly higher mortality than those with normal LA volume. Those with LAVi > 34ml/m2 account for 60% of all IMR mortality, despite fewer ST elevation infarcts and smaller troponin rise. Future studies of intervention for IMR should consider LA dilatation as a potential marker of outcome.
Conduct of Interest None

The Effect of Different Contouring Techniques on Cardiac Magnetic Resonance Assessment of Right Ventricular Volumes in Repaired Tetralogy of Fallot: Implications on Preoperative Thresholds for Intervention

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Introduction Patients with repaired tetralogy of Fallot (RTOF) develop chronic pulmonary regurgitation and require monitoring for right ventricular dilatation. Pulmonary valve replacement can prevent irreversible right ventricular (RV) dilatation and dysfunction and cardiac magnetic resonance (CMR) is used to facilitate its optimal timing. There are however, different techniques published for measuring RV volumes. We sought to determine whether the choice of myocardial contouring technique affects preoperative RV volumetric thresholds for intervention.

Methods Consecutive patients (n = 24, age 25.2±15.5 years, 42% male) with RTOF were identified retrospectively, having undergone CMR for clinical surveillance at a Level 1 ACHD surgical referral centre. Volumetric analysis was made by two experienced, independent observers blinded to clinical status. Right ventricular volumes were measured using three contouring techniques: 1) smooth, where the trabeculae were counted as part of the blood volume; 2) detailed, using semi-automated thresholding; 3) detailed, with manual contours. For 2) and 3), trabeculae and sub-valvar apparatus were counted as part of the myocardium. Inter-observer variability (F.L. & C.M.) was assessed blinded in 5 randomly selected patients.

Results Right ventricular end-diastolic volume (EDV) was largest for smooth contours compared with thresholding and