ultrasoundography (CEU) targeting VCAM-1 might allow the molecular imaging of VCAM-1 in an experimental model of atherosclerosis.

**Methods:** Atherosclerotic lesions were induced by highcholesterol diet in 20 male New Zealand white rabbits. CEU molecular imaging for aortic endothelial VCAM-1 expression was performed with VCAM-1-targeted (MBVCAM) and control microbubbles (MBIct). Histology, immunohistochemistry and real time qPCR were used to assess plaque burden and VCAM-1 mRNA expression.

**Results:** In the atherosclerosis group, the peak signal intensity of targeted microbubbles increased compared with the control group (29.99±2.55 vs 0.05±2.46±2.25, P<0.01). Retention of VCAM-1 targeted microbubbles was significantly higher than retention of non-targeted microbubbles (21.56±1.12 vs 15.24±1.02, P<0.01). VCAM-1 mRNA expression in atherosclerosis group was 60-fold higher than in control group (3.08±0.61 vs 0.05±0.102, P<0.001). In addition, the PSI of atherosclerotic wall enhancement detected with ultrasound after injection of VCAM-1 targeted contrast agent highly correlated with indeed VCAM-1 mRNA expression measured in corresponding abdominal segments using real time qPCR (r=0.865, P<0.001).

**Conclusions:** VCAM-1 targeted CEU can detection and quantification of VCAM-1 expression in an experimental atherosclerotic model. This easily accessible, low-cost technique may be useful in assessing treatment effects in preclinical research and in patients.

GW25-e3542

The Experimental study of noninvasive evaluation of vascular phantom Elasticity with ultrasound radiofrequency-data technique

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**Objectives:** As a novel, noninvasive vessel wall tracking technique, ultrasound radiofrequency (RF)-data technique has been used preliminary for evaluating artery wall elasticity in clinic, which has potential for detecting early stage atherosclerosis. This objective was to investigate the feasibility and accuracy of ultrasound RF-data technique for detecting vessel wall elasticity by vascular phantom experiment.

**Methods:** Five standard-uniﬁed vascular phantoms were manufactured, and the mechanical stiffness of phantom wall was determined as 35HA, 40HA, 45HA, 50HA and 55HA, respectively. A closed-ring compression system was built, which was similar to human circulatory system. And then the phantom wall elastic parameters including compliance coefﬁcient (C), distensibility coefﬁcient (D), stiffness (S) and single point pulse wave velocity (PWV) were calculated automatically by ultrasound RF-data technique. Every vascular phantom was measured three times respectively, and the results were analyzed by using linear regression analysis.

**Results:** Mechanical stiffness of vascular phantoms correlated with DC (r=0.962, P<0.001), S (r=0.984, P<0.001), PWV (r=0.978, P<0.001) and CC (r=0.805, P<0.01). With the mechanical stiffness of vascular phantoms increase, the mean value of elastic parameters measured by ultrasound RF-data technique were (1) 0.030±0.010 kPa, 0.027±0.006 kPa, 0.017±0.006 kPa, 0.010±0.000 kPa and 0.010±0.000 kPa for DC, (2) 0.923±0.220 mm/kPa, 0.593±0.105 mm/kPa, 0.437±0.106 mm/kPa, 0.540±0.079 mm/kPa and 0.443±0.116 mm/kPa for CC, (3) 3.156±1.118, 3.627±0.641, 5.743±1.004, 6.830±0.135 and 7.797±0.263 for S, (4) 6.467±2.209, 7.440±1.274, 11.663±1.995, 18.837±0.337 and 15.760±0.521 for PWV, (5) 5.663±0.951 mm/s, 6.217±0.580 mm/s, 7.793±0.695 mm/s, 8.683±0.460 mm/s and 9.030±0.234 mm/s for PWV.

**Conclusions:** Ultrasound RF-data technique can distinguish the variation tendency of the mean value of elastic parameters measured by ultrasound RF-data technique were significantly higher than in control group (3.08±0.61 vs 0.05±0.102, P<0.001). In addition, the PSI of atherosclerotic wall enhancement detected with ultrasound after injection of VCAM-1 targeted contrast agent highly correlated with indeed VCAM-1 mRNA expression measured in corresponding abdominal segments using real time qPCR (r=0.865, P<0.001).

**GW25-e4258**

Altered left ventricular torsion and function during normal pregnancy

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**Objectives:** Left ventricular torsion and subsequent untwisting, the helical twisting and untwisting motion of the LV about its longitudinal axis, play an important role in myocardial contractility and structure. Alterations in left ventricular twist and untwist have been described for a variety of physiologic and pathologic conditions. During pregnancy, the cardiovascular system adapts to the metabolic needs of mother and fetus. The effects of this adaptation on left ventricular torsion and untwist have not been well documented. The aim of this study was to evaluate the LV torsional mechanics during normal pregnancy.

**Methods:** 2D speckle tracking imaging were performed in 80 woman, aged (mean±SD) 32.4±4.6 years at gestational weeks 14-16, 24-36, and 6 months postpartum. LV torsion was defined as apical rotation relative to the base. LV rotation, left ventricular rotations were obtained at basal and apical short-axis levels, untwisting rate and untwisting rate in IVRT were also analyzed.

**Results:** (1) Cardiac output and LV end-diastolic volume were on average 20% and 23%higher, respectively, during pregnancy; (2) Analysis of LV torsional behavior revealed that compared to that 6 months postpartum (12.69±2.9), there was a significant increase in peak LV twist from14-16weeks (12.38±2.7), 16-24 weeks (13.04±2.4), 24-36 weeks (15.67±3.9) (all P<0.005). (3) Changes of LV untwist behavior revealed there was a significant increase in LV untwisting rate during pregnancy (118.34±28.89/sec, 109.76±23.53/sec, 154.43±48.28/sec) compared to that 6 months postpartum (112.73±27.94/sec), but untwisting rate in IVRT was descreased during pregnancy. (4) Changes to LV torsion and subsequent untwisting, the helical twisting torsion and subsequent untwisting, the helical twisting

**Conclusions:** There are significant changes in LV torsional indices during normal pregnancy, whereas LV twist and peak untwisting rate increase and correlate with end-systolic and stroke volume, respectively.
SonoVue-aFGF solution through tail vein and using UTMD simultaneously. All rats underwent conventional echocardiography and RT-MCE exams before and four weeks after intervention. Left ventricular ejection fraction (LVEF) and Left ventricular short axis short rate (LVFS) were measured by conventional echocardiography. The plateau intensity (A), initial slope of the curve (β) and myocardial blood flow (A×β)(β) left ventricular anterior wall at the papillary muscle level were measured in left ventricular short-axis view by RT-MCE. At last, myocardial tissue of each group rats were stained with CD31 immunohistochemistry to observe distribution of microvessels and to quantify myocardial microvascular density (MVD) and used with transmission electron microscope to observe the myocardial cell ultrastructure changes.

**Results:** Before intervention, LVEF and LVFS in the DCM model group, aFGF only group and the SonoVue-aFGF+UTMD group were significantly lower than in the normal control group (P<0.01). Four weeks after intervention, LVEF and LVFS in the aFGF only group and SonoVue-aFGF+UTMD group were slightly increased than in the DCM model group, but no statistically significant differences were found (P>0.05). Four weeks after intervention, A and A×β in the SonoVue-aFGF+UTMD group were significantly increased than in the DCM model group (P<0.01); A, β and A×β in the DCM model group and aFGF only group were significantly lower than in the normal control group (P<0.01). Compared with the same group before intervention, A and A×β in the SonoVue-aFGF+UTMD group were higher (P<0.05) and these in the DCM model group were lower four weeks after intervention (P<0.05). The MVD in the DCM model group were significantly decreased than in the normal control group (P<0.01), while the MVD in the SonoVue aFGF + UTMD group were increased significantly than in the DCM model group (P<0.05). Moreover, the MVD in the aFGF only group were not obviously increased than DCM model group (P>0.05). Transmission electron microscope results show the myocardial cell ultrastructure in SonoVue-aFGF + UTMD group obviously improved compared with DCM model group.

**Conclusions:** Acute fibroblast growth factor delivered by using ultrasound-targeted microbubbles can improve the left ventricular myocardial performance in diabetic cardiomyopathy rats by enhancing angiogenesis, improving the myocardial microcirculation. It may be used as a promising method of diabetic cardiomyopathy therapy.

GW25-e4597

**T1 mapping by CMR in patients with arrhythmic cardiomyopathy: relation to left ventricular performance**

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**Objectives:** We aimed at exploring associations between myocardial post-contrast T1 reductions as a surrogate for ischemic fibrosis with left ventricular (LV) structure and function in non-ischemic arrhythmic cardiomyopathy. **Methods:** Twenty-one patients with arrhythmia underwent cardiac magnetic resonance imaging. We compared LV function and myocardial fibrosis between diabetic cardiomyopathy patients and patients of untreated prolactinomas with normal LVEF and no symptoms of cardiovascular diseases.

GW25-e1058

**Assessment of the Left Atrial Appendage Using Real-time Three Dimensional Transesophageal Echocardiography**

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**Objectives:** The left atrial appendage (LAA) is a common source of cardiac thrombi formation associated with systolic embolism, particularly in patients with nonvalvular atrial fibrillation (AF). Transesophageal echocardiography is performed routinely among AF patients in order to exclude LAA thrombi prior to radiofrequency catheter ablation. Left ventricular systolic dysfunction is a major independent predictor of decreased LAA size and CHADS2 score, to find the sensitive parameters to forecast thrombus risk.

GW25-e1447

**Clinical Significance of Multidisciplinary Coronary CT Angiography in Asymptomatic Patients With Type 2 Diabetes Mellitus**

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**Objectives:** The purpose of this study was to investigate the prevalence of coronary atherosclerotic lesions among asymptomatic patients with type 2 diabetes mellitus. **Methods:** Multidisciplinary coronary computed tomography (CT) angiography was performed in 240 consecutive diabetic patients. Images from patients whose coronary artery calcium scores (CAC scores) were less than 400 were subjected to stenosis and plaque analysis. Significant stenosis was defined as coronary artery stenosis >70%.