imaging in hypertensives with left ventricular hypertrophy. TDI imaging unmasks subtle changes in the diastolic function of the right ventricle.

P2458 | BEDSIDE
Total average diastolic displacement by colour tissue doppler imaging as an assessment of diastolic function
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Purpose: The current method for a non-invasive assessment of diastolic dysfunction is complex with the use of algorithms of many different echocardiographic parameters. Total average diastolic displacement, determined by color Tissue Doppler Imaging (TDI) via the measurement of displacement during early diastole and atrial contraction, can potentially be used as a simple and reliable alternative.

Methods: Using GE Healthcare Vivid E7 and 9 and Echopac BT11 software, both diastolic displacement (area under the curve of the e` and a` wave), measured in the septal and lateral walls in the apical 4-chamber view by color TDI, and the degree of diastolic dysfunction, using the current guidelines, was determined in 266 patients. Of these 206 patients, 157 had cardiac anomalies that could potentially affect diastolic displacement such as reduced Left Ventricular (LV) ejection fraction (n=45), LV hypertrophy (n=49), LV dilatation (n=30), and mitral regurgitation (n=33). Intraclass correlation coefficient was used to calculate the Bland-Altman method in 125 patients.

Results: A linear relationship between total average diastolic displacement and the degree of diastolic dysfunction was found. A total average diastolic displacement of 10 mm was found to be a consistent threshold for the general discrimination of patients with or without diastolic dysfunction. Patients with LV hypertrophy had preserved displacement measurements despite being classified as having either an abnormal or a pseudonormal relaxation pattern. Reproducibility of displacement measurements was acceptable.

Conclusions: Patients with a total average diastolic displacement under 10 mm almost certainly have diastolic dysfunction.

P2459 | BEDSIDE
Echocardiography can be used to rule in but not rule out elevated right atrial pressure in heart transplant recipients

Background and aim: Right ventricular failure in heart transplant recipients is a known risk factor for death and retransplantation. Elevated Right Atrial Pressure (RAP) is a hallmark of right ventricular failure. In the present study we investigated the ability of echocardiography to identify heart transplant recipients with increased RAP (> 8 mmHg).

Methods: Patients with echocardiography and right heart catheterization within 24 hours were included (n=97, 110 investigations). The estimation of Right Atrial Pressure (RAP) was in categories (0, 5, 10, 15, 20 mmHg) and based on the effect of respiration or sniffing on the maximum and minimum Inferior Vena Cava (IVC) diameters. The caudal index was calculated [(IVCmax-IVCmin)/IVCmax x 100]. Doppler estimation of RAP was performed using standard tricuspid (E/A, Deceleration Time (DT)), hepatic vein (S/D) and tissue Doppler (E’/E’) variables. Cut-off values were generated to determine increased RPA using receiver-operator characteristic analysis.

Results: The mean±SD age was 36±13 years and 78% were males. The post-transplant time interval (median, 25 and 75 percentiles) was 265 days (98 to 355). Rejection > ISHLT grade 2R was found in 6.3% and elevated RAP in 45%. The linear relation between catheter RAP and E/A DT was not significant and the linear relation to E’/E and hepatic vein S/D was weak (R/ρ-value 0.28/0.006 and 0.46/−0.0001 respectively. Best diagnostic performance was found using the IVC variables and estimation of RAP in categories (Table). The presence of increased RAP by echocardiography increased the likelihood of elevated RAP 6.0 fold. The negative likelihood ratio for normal RAP by echocardiography indicated only small decrease in likelihood of increased RAP.

Conclusions: Echocardiography assessment of IVC dimension and collapsibility significantly increases the likelihood of elevated RAP in heart transplant recipients.

P2460 | BEDSIDE
Computed tomography-derived three-dimensional pericardial adiposity as an independent determinant in mediating ventricular diastolic dysfunction, ventricular dyssynchrony and atrial remodeling
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Purpose: Both diastolic dysfunction and mechanical dyssynchrony are important factors in the pathophysiology of heart failure (HF). Recently, local visceral adiposity has been shown to mediate several critical biological activities, though data regarding its effect on cardiac mechanics had not been well-described.

Methods: We assessed pericardial fat (PCF) by volume-rendered, multidetector computed tomography (MDCT) on 319 subjects (mean age: 53.5 years, 37% female) free from HF symptoms in a health evaluation program. Atrial diameter and several Doppler-defined diastolic parameters as well as mitral annulus systolic (S’) and early diastolic (E’) velocities by tissue Doppler imaging (TDI) were all obtained by echocardiography. Dyssynchrony indices were defined as the maximal time differences to peak S’ and E’ between ventricular medial and basal lateral segments, respectively.

Results: In multivariate analysis after adjusting for age, gender, body-mass index, ventricular mass and clinical covariates, increasing PCF was significantly related to reduced E’ (Coef=−0.02), increased E’ (Coef=0.02), LA diameter (Coef=0.04) and diastolic dyssynchrony (Coef=0.13, all p<0.0005).

Conclusions: Our study suggested that pericardial fat burden may exert independent adverse effects on ventricular mechanical performance including diastolic function and intraventricular dyssynchrony, which are both important factors in the pathogenesis of HF.

P2461 | BEDSIDE
Assessment of left sided filling dynamics in diastolic dysfunction using cardiac computed tomography
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Purpose: Left ventricular (LV) diastolic dysfunction (DD) involves a complex inter

<table>
<thead>
<tr>
<th>Variable</th>
<th>Univariable model</th>
<th>Multivariable model*</th>
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<tbody>
<tr>
<td>Coef</td>
<td>95% CI</td>
<td>p value</td>
</tr>
<tr>
<td>Mitrval E</td>
<td>−0.02</td>
<td>−0.08 to 0.03</td>
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<tr>
<td>DT</td>
<td>0.20</td>
<td>0.06 to 0.34</td>
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<tr>
<td>IVRT</td>
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<td>0.005 to 0.11</td>
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<tr>
<td>E/A</td>
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<tr>
<td>TDI lateral E’</td>
<td>−0.03</td>
<td>−0.02 to −0.04</td>
</tr>
<tr>
<td>TDI lateral S’</td>
<td>−0.007</td>
<td>−0.01 to −0.006</td>
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<tr>
<td>E/E’</td>
<td>0.01</td>
<td>0.01 to 0.02</td>
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<tr>
<td>LA diameter</td>
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</tr>
<tr>
<td>S’</td>
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<td>0.08 to 0.22</td>
</tr>
<tr>
<td>S’ dyssynchrony</td>
<td>0.09</td>
<td>0.009 to 0.18</td>
</tr>
</tbody>
</table>

*Adjusted for age, gender, body-mass index, systolic blood pressure, LV mass, history of hypertension, diabetes or coronary artery disease. Abbreviations: Coef, coefficient; CI, confidence interval; DT, deceleration time; IVRT, isovolumetric relaxation time; E, early mitral inflow velocity; E/A, early-to-late inflow ratio.

Conclusion: Our study suggested that pericardial fat burden may exert independent adverse effects on ventricular mechanical performance including diastolic function and intraventricular dyssynchrony, which are both important factors in the pathogenesis of HF.

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action between LV and left atrial (LA) filling dynamics. Until now, it has not been possible to easily obtain simultaneous LV and LA volume curves to perform this analysis. We aimed to analyse CTA-based filling dynamics in a group of patients with DD and in a normal control group, compared to Echo-Doppler.

Methods: We identified 40 patients who had various grades of DD by echo-Doppler, and who had undergone cardiac CT angiography within 1 month, as well as 37 normal controls. LV and LA volumes were measured every 10% of the RR interval, using semi-automatic commercial software, and end-diastolic (ED), end-systolic (ES) and mid-diastolic (MD) identified. From these 3 volumes, systolic, early-diastolic and late-diastolic volume changes were calculated, and additional parameters of diastolic filling derived (see Table).

Results: Patients with DD had larger LV volumes and mass and lower ejection fraction (LVEF) than controls. They had significantly larger LA volumes and significantly worse LA function, manifesting as reduced early, late and total emptying fraction (LATEF) and increased conduit volume as % early filling (%CV/E). By ROC analysis, LA MD volume had an AUC of 0.92 to separate between normal and DD, while LATEF had an AUC of 0.88 and %CV/E an AUC of 0.77. Logistic regression using LA MD volume, LV mass and early-diastolic emptying fraction, had a 90% accuracy to separate between the 2 groups. Severe DD was further characterized by a significant reduction in late LA contractile function.

Conclusion: DD is characterized by significant LA enlargement as well as reduced LA function, which worsens with worsening DD. CT can help detect and characterize DD, mainly via its effect on LA emptying dynamics.

**EPIDEMIOLOGY AND OUTCOMES**

P2465 | BENCH
Prognostic significance of tricuspid regurgitation peak velocity in patients with heart failure and preserved ejection fraction

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Background: In patients with heart failure and preserved ejection fraction (HF-P EF), tricuspid regurgitation peak velocity (TRPV) may help to stratify the clinical risk. Data are limited, and the purpose of this work is to investigate the prognostic significance of TRPV in HF-P EF.

Methods and results: Eighty five consecutive patients with HF-P EF (Framingham criteria, EF > 50% and BNP > 200 pg/ml, recommendation ESC 2009) who prospectively underwent quantitative Doppler echocardiographic measurements were followed up for 12 months. Of these, 48 had an overt or suspected elevated pulmonary artery pressure (TRPV > 2.8 m/s) and 28 presented cardiac events during follow-up (readmission for heart failure or cardiac death), being univariate analysis, patients who had elevated TRPV exhibited more stroke (p = 0.037), and anemia (p = 0.024). Furthermore, they had higher transmural early E wave peak velocity (p = 0.001), transmitral E/A ratio (p = 0.029), blood to tissue E/e' ratio (p = 0.030), and larger left atrium (p = 0.028). These patients experienced more frequently symptoms of dyspnea (p = 0.006). By multivariate Cox regression analysis, independent predictors of cardiac events were as follows: an increase in mean TRPV > 2.8 m/s (ROC, sensibility 77.8, specificity 61.4, p=0.015, IC [1.50-18.73]), an history of ischemic heart disease (p = 0.033, CI [1.01-32.44]), and a smaller left ventricular end-diastolic diameter (p = 0.003, CI [0.71-0.93]). Tricuspid regurgitation peak velocity provided incremental prognostic value in patients with HF-P EF (logrank, p = 0.015, figure 1).

Conclusions: Tricuspid regurgitation peak velocity could be useful to identify a high-risk subset of patients with heart failure and preserved ejection fraction.

Logrank curve assessing the occurrence of cardiac events.