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( )

## pulse tissue Doppler

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*pulse tissue Doppler (PTD)*

*PTD Doppler M Mode 2D*

*PTD*

*(Early peak velocity/ Late peak velocity) E/A PTD*

*DT (Deceleration time) (P< / ) RT (relaxation time) (P< / )*

*E/A (P< / ) late peak velocity(Am) (P< / )*

*(P< / r= / ) E/A*

*Longitudinal*

*E/A RT*

*PTD*

*pulse tissue Doppler :*

*Congestive Heart Failure ( )*

*hasannamazi@yahoo.com :*

[ (BP ≥ / ) ] ( )

[

( ) after load

: remodeling geometry

Valvular regurgitation ( )

Valvular heart disease

ECC ( )

wall motion abnormality pulse Doppler

(pulmonary hypertension COPD ) ( )

Congestive Heart Failure ( )

( ) direction

Doppler pulse tissue Doppler

( )

PTD ( )

HR ( )

Longitudinal

Doppler M-mode 2D ( )

pulse tissue Doppler

Vingmed system five ultrasound system ( )

tissue Doppler Longitudinal

3.5 MHS

Septal wall M-Mode pulse tissue Doppler

left ventricular post wall right ventricular ant wall

(Dimension Left Ventricular End Diastolic) LVEDD

(LV End Systolic Dimension) LVESD

left ventricular fractional shortening

TAPSE

[ S (Tricuspid Annular Plane Systolic Excursion)  
 Em peak(m/s)  
 Am peak(m/s) [myocardial early peak velocity] 2D TAPSE ( )  
 [ myocardial late peak velocity ] apical four chamber  
 [deceleration time] DTm(ms) Em/Am  
 relaxation time] RTm(ms) RV  
 [ Em Sm  
 mean ± SD EF=3.2×TAPSE(mm)  
 SPSS 11.5 Kaul ( ) RV  
 t Chi-square pulse Doppler  
 P< / sample volume apical four chamber  
 Tip  
 A-peak velocity E-peak velocity  
 (Isovolumic relaxation time) IVRT E/A  
 (Diastolic filling period) DFP  
 DFP E/A Apeak Epeak  
 (heart rate) pulse tissue Doppler ( )  
 BMI 3.5 MHS  
 sample volume apical four chamber  
 (P< / ) lateral mitral annulus  
 2D M Mode LV  
 ) RV ant wall thickness sample volume  
 (P< / / ± / / ± / RV lateral tricuspid annulus  
 ) LV post wall thickness pulse tissue Doppler  
 (P< / / ± / / ± / Sm  
 / ± / ) LVEDD Am Em  
 (P< / ± Sm peak (m/s) :  
 PCT (mm) [myocardial systolic peak]  
 left ventricular- LVESD QRS precontraction time]  
 TAPSE fractional shortening contraction time ] CT(mm) [ Sm



(P< / )

PTD

RV

:

(.)

Em

Em

Myslinski

mild to mod

(P< / r= / )

Em/Am

Em/Am

peak velocity

(P< / r= / )

RV filling

TE/TA

( )

(.)

LV filling

RTm

RTm

(P< / r= / )

PTD

DTm Am

Cicala

PTD

Em/Am

(P< / ) DTm (P< / ) RTm (P< / )

(P< / ) Em peak

( )

PTD

M Murat Tumuklu

PTD

lat tricuspid annulus

E/A (P< / ) peak A (P< / ) peak E

mid RV free wall PTD (P< / )

E/A (P< / ) A (P< / ) E

(P< / ) peak (P< / )

Strain Imaging PTD

Doppler

pulse Doppler

Chakko

(.)

DT (P< / )

RV peak velocity

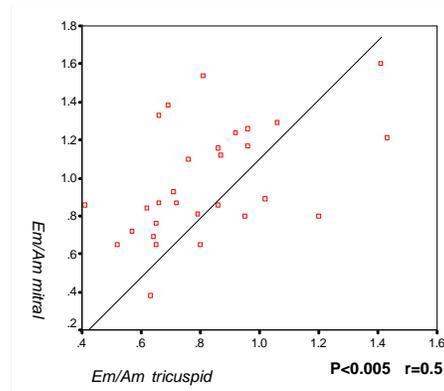
E/A

(P< / )

(right ventricular wall impairment)

SV

peak filling rate



Em/Am

overload                      Longitudinal

Longitudinal

PTD

Em/Am                      ventricular relaxation                      Em :

RTm   DTm                      atrial activity                      Am

Em/Am <                      (P< / )

( )                      M Murat Tumuklu   Cicala                      RTm (P< / )

isometric relaxation

PTD                      (P< / ) DTm (P< / )

TAPSE

Ventricular interaction                      PTD

pulse tissue Doppler                      filling                      filling

Doppler                      RTm   Em/Am   Em peak

DTm   Am peak

video tape                      functional intraction                      Em/Am

passive

**REFERENCES**

1. John D, Otto C, Hess M. Assessment of normal and abnormal cardiac function. In: Zipes DP, Bonow R, Braunwald E, editors. Heart disease, 7<sup>th</sup> ed. Philadelphia: Elsevier. 2005; PP: 497-501.
2. Dougherty AH, Naccarelli GV, Gray E, Hicks CH, Goldstein RA. Congestive heart failure with normal systolic function. Am J Cardio 1984; 54: 778-82.
3. O' Conner CM, Gattis WA, Shawl L, Cuffe MS, Califf RM. Clinical characteristics and long-term outcome of patients with heart failure and preserved systolic function .Am J Cardiol 2000; 86: 863-7.

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4. Galderisi M, petrocelli A, Alfieri A, Garofalo M, de Divitis O. Impact of ambulatory blood pressure on left ventricular diastolic function. *Am J Caradiol* 1996; 77: 597-601.
  5. Cicala S, Galderisi M, Caso P, Petrocelli A, D'Errico A, de Divitiis O, et al. Right ventricular diastolic dysfunction in arterial systemic hypertension analysis by pulsed tissue Doppler. *Eur J Echocardiogr* 2002; 3(2): 135-42
  6. Chakko S, de Marchena E, Kessler KM, Materson BJ, Myerburg RJ. Right ventricular diastolic function in systemic hypertension. *Am J Cardiol* 1990; 65:c1117-20.
  7. Myśliński W, Mosiewicz J, Ryczak E, Barud W, Biłan A, Palusiński R, et al. Right ventricular diastolic function in systemic hypertension. *J Human Hypertension* 1998; 12 :149-155.
  8. Caso P, Galderisi M, Cioppa C, Severino S, De Simone L, Izzo A, et al. Regional diastolic function in normotensive versus hypertensive subjects: comparison using Doppler myocardial imaging. *G Ital Cardiol* 1997;27(1): 901-7.
  9. Poulsen SH, Andersen NH, Ivarsen PI, Mogensen CE, Egeblad H. Doppler tissue imaging reveals systolic dysfunction in patients with hypertension and apparent "isolated" diastolic dysfunction. *J Am Soc Echocardiogr.* 2003; 16(7): 724-31.
  10. Garcia-Fernandez MA, Azevedo J, Moreno M, Bermejo J, Moreno R. Regional Left Ventricular Diastolic Dysfunction Evaluated by Pulsed-Tissue Doppler Echocardiography. *Echocardiography* 1999; 16: 491-500.
  11. L eggio M, Sgorbini L, Pugliese M, Mazza A, Bendini MG, Fera MS, et al. Systo-diastolic ventricular function in patients with hypertension: an echocardiographic tissue doppler imaging evaluation study. *Int J Cardiovasc Imaging* 2007; 23(2):177-84.
  12. Tumuklu MM, Erkorkmaz U, Ocal A. The impact of hypertension and hypertension-related left ventricle hypertrophy on right ventricle function. *Echocardiography.* 2007; 24(4): 374-84.
  13. Kaul S, Tei C, Hopkins JM, Shah PM. Assessment of right ventricular function using two dimensional echo. *Am Heart J* 1984; 107: 526-31.