

MEDICINE

Advanced Editing

The objective of this study ~~is was~~ to investigate a new non-invasive method for ~~calculation-calculating of~~ the left ventricular diastolic time constant, Tau, through continuous-wave aortic regurgitation Doppler spectrum. ~~Guided by Using~~ ultrasound ~~guidance~~, 18 animal models (~~Beagles~~) of aortic regurgitation and acute ischemic left ventricular diastolic dysfunction were created ~~on the Beagles~~. By manipulating the left ventricular diastolic dysfunction with ~~medicine~~ ~~medications~~, 42 hemodynamic stages were achieved. ~~Collecting r~~Raw audio signals of the continuous-wave Doppler spectra ~~were collected, and then~~ new aortic regurgitation Doppler spectra were ~~then built-acquired~~ after ~~reprocessing by a PC-reprocessing~~. By ~~now~~ ~~T~~the ~~updating time of the spectral line~~ ~~updating time is was~~ as short as 0.3 ms. The new Doppler spectra contour line was automated ~~with the help of using~~ MATLAB (ver-sion R2009), and the two time intervals, (t1-t2) and (t1-t3), were measured on the ascending branch of the aortic regurgitation Doppler spectrum. Next, the two time intervals were substituted into Bai's equations group, and the Doppler-derived Tau (Tau-d) was resolved and compared with the catheter-derived Tau (Tau-c). ~~There was no significant difference between~~ Tau-d (52.062 ±14.852 ms), ~~and~~ Tau-c (49.457 ±15.339 ms); ~~there is no significant difference~~ (P > 0.05). ~~The~~Correlation analysis between Tau-c and Tau-d suggests ~~ed~~ a strong positive relationship, with ~~the a~~ correlation coefficient of ~~r = 0.86, (P = 0.000)~~. The Bland-Altman plot of Tau-c and Tau-d reveals ~~ed~~ a fair agreement. Compared with ~~the~~ previous non-invasive approaches, this ~~new calculation~~ method is simple, ~~and~~ convenient, and there is a strong positive relationship with the ~~gold standard~~ catheter method ~~as a as well as gold standard and a fair agreement as well~~.

~~Tau is an index happened~~ ~~can be measured~~ within the isovolumic diastolic period, when both the aortic valve and mitral valve are closed. Obviously, only three approaches are available to calculate Tau; ~~the first is (1) putting~~ ~~placing~~ a catheter ~~into the left ventricle~~, with ~~the a tip mounted with a high-fidelity~~ pressure sensor ~~mounted to the catheter tip into the left ventricle~~; ~~the second is with (2)~~ mitral regurgitation; ~~and the third is (3) with~~ aortic regurgitation. The first approach is an invasive method, ~~and~~ the second and the third approaches are non-invasive Doppler methods.

Commented [ED1]: This sentence has been extensively edited for better readability. Please check if the revision conveys your intended meaning.