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LEFT VENTRICULAR EARLY RAPID FILLING AND LEFT ATRIAL BOOSTER PUMP FUNCTION IN PATIENTS WITH MYOCARDIAL INFARCTION.

Ken Ishida,Takeshi Arita,Kenji Ishine, Youji Handa,Toshio Ohya and Nobuhiro Ohta. Shimane Prefectural Central Hospital, Izumo.

Ejection fraction(EF),peak rapid filling rate(PRF) and peak atrial filling rate(PAF) were measured from left ventricular(LV) volume(V) curve and its dV/dt curve obtained from the ECG gated radionuclide ventriculogram constructed in a backward fashon from the R wave to the preceding R wave in 66 patients(Pts) with myocardial infarction(MI) and in 16 normal controls(N). Pts were divided into three groups according to EF; group A=21 Pts with EF≥60%,group B=31 Pts with 40%≤EF<60%,group C=14 Pts with EF<40%. EF was not significantly different in N and group A(68±5 vs 66±5%) but PRF was significantly lower in group A than in N(2.4±0.5 vs 3.3±0.5/sec,p<.01). PAF was significantly higher in group A and B than in N and group C(1.8±0.6,1.6±0.5 vs 1.1±0.2,1.1±0.4/sec, respectively,all p<.01). PRF showed close correlation with EF(r=0.72,p<.01)in 66 Pts with MI. Conclusion:(1) PRF and PAF were more sensitive indexes in detecting myocardial damage.(2) LV early rapid filling was correlated to systolic performance.(3) Left atrial booster pump function compensated impaired LV filling in early diastole in mild LV failure, but there were no such compensation in severe LV failure.

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CLINICAL EVALUATION OF LEFT VENTRICULAR FUNCTION IN HEART DISEASES, USING SECOND HARMONICS OF FOURIER ANALYSIS. K.Shimabukuro, M.Nakajo, H.Yoshimura, R.Yonekura, H.Sakata, A.Okada, S.Shinohara, M.Kawataki, H.Tabuchi, H.Kataoka, K.Nakamura. KAGOSHIMA UNIVERSITY MEDICAL SCHOOL, KAGOSHIMA.

A cardiac phantom study showed that the EF(ejection fraction) and ET(ejection time) of gated blood pool images obtained by second order harmonics Fourier analysis method, were more approximate to the actual phantom data than those obtained by the 3-point time smoothing method. Therefore, we used this Fourier analysis to evaluate the left ventricular function in patients with hypertrophic cardiomyopathy (HCM, 10 cases), old myocardial infarction (OMI, 20 cases) angina pectoris (AP, 5 cases), hypertensive heart disease (HHD, 3 cases), and normal subjects (10 cases).

Patients with HCM showed increased EF, increased PER (peak ejection rate), low PFR (peak filling rate) and delayed TPF (time to peak filling) than normal subjects did. Patients with OMI showed significantly lower EF, PER, PFR and higher ET, TPE. Patients with HHD showed increased EF and PER. However, in patients with AP no abnormalities were detected in these incides.

We concluded that second order harmonics Fourier analysis is a useful method to evaluate the left ventricular function of patients with HCM, OMI and HHD.

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Evaluation of Left Ventricular Volume Curve in Patients with Atrial Fibrillation by ECG Gated Scintigraphy. S.Inagaki,S.Mochizuki, I.Niki.National Yohkaichi Hosp. H.Adachi, H.Ijichi.Kyoto Prefectural Univ of Medicine

ECG gated blood pool scintigraphy (EGBS) is not valid for the patients with atrial fibrillation (AF), scince there is wide variability in cycle length (CL). To evaluate the left ventricular (LV) function during AF by EGBS, we devised a new algorithm to construct LV volume curves (VC) discriminated by preceding CL from the data acquired in list mode. LV volumes were obtained with blood sampling and count to volume conversion technique, and LV function curve (FC) was assessed by plotting SV against EDV. In normal controls, EF, peak ejection rate and EDV were increased with longer preceding CL, but ESV was decreased, and these changes were less in CHF group and almost none in cases of constrictive pericarditis. These parameters obtained by the conventional method with assumption of all CL nearly corresponded to the average values by our method. LVFC in CHF were situated right & downward to control FCs, and left & upward shift was demonstrated after the treatment. The slopes of LVFC were reduced in relation to the progression of NYHA's functional class.

In conclusion, this new algorithm processing irregular CL provides LVVC corresponded to preceding CL, and derived LVFC is useful in the evaluation of cardiac performance in subjects with AF.

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Detection And Evaluation of Left Atrial Myxoma By Gated Radionuclide Imaging. H. Sugihara, H.Adachi, H.Nakagawa, K. Furukawa, J. Asayama, H. Katsume, K.Okamoto*, T Miyazaki, M. Yamashita* and H. Ijichi. 2nd Department of Medicine, *Radiology , Kyoto Prefectural University of Medicine , Kyoto

In the diagnosis of left atrial myxoma (LAM) radionuclide method plays an important role. We discussed diagnostic value of Fourier analysis with phase image and evaluated cardiac function from left ventricular (LV) filling feature. Equillibrium gated radionuclide angiocardiography was performed in 6 LAM patients.

Phase delay in the basal portion of the left ventricle was showed in 5 of 6 patients, and Rapid Filling Fraction (RFF) calculated by LV volume curve was smaller in 5 patients than these in controls. After surgical operation phase delay was disappeared and standard deviation of LV phasa was normalized. And RFF was improved after operation.

We concluded that both the phase image of Fourier analysis for revealing a left atrial mass prolapsing in the left ventricle during the diastole and RFF for evaluation of LV filling disturbance were useful.

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