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A NEW PHASED ANALYSIS USING FOURIER'S TRANSFORMATION OF GATED BLOOD POOL SCINTIGRAM. Y. Futamura, J. Sakurai, K. Sakakura, T. Furuta. Department of Cardiology, Meitetsu Hospital, Nagoya. N. Kawai. 1st Dept. of Intern medicine, Nagoya University School of Medicine.

Recently, Fourier's transformation is used to analyse the time activity curve of the radioventriculogram as a temporal filter. The each pixel's phase of the 1st harmonics of Fourier's series represents the outline of left ventricular contractile pattern. But the approximated phase of 1st harmonics is easily influenced by ventricular diastolic duration and signal to noise ratio of its image is not so good. As above reasons, it is expected to develop the more precise approximation of ventricular time activity curve. In this study, the following method was used to minimize the influence of the long diastolic duration. The difference of the area surrounded by the original time activity curve of the ventricle and the 1st harmonics fitted to it was measured by using Minc11 digital computer(DEC). The cyclic length of the ventricular Fourier transformation was reduced one by one frame and the area difference was calculated at each cyclic length. At the least area difference, the 1st harmonics was most fitted to ventricular time activity curve. By using such a method, cardiac contractile pattern was analysed more precisely in comparison with usually used phased analysis and, in normal subject, resolution of the phase image was less than 15m seconds.

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SUPERIORITY OF THE LEFT VENTRICULAR PHASE ANALYSIS OF A LONG AXIS VIEW USING A MULTI-CRYSTAL GAMMA CAMERA. R. Futatsuya, H. Seto, J. Yamanishi, T. Kamei, N. Furumoto and M. Kakishita. Toyama Medical and Pharmaceutical University. Toyama.

We reported the reliable left ventricular phase analysis of a long axis view for the regional wall motion evaluation. In this study, we compare the results of this method, those of movie observation, regional wall motion image and phase analysis in LAO view.

In 22 normal and 26 abnormal cases diagnosed by contrast left ventriculography, 20 mCi of Tc-99m pertechnetate was injected and serial images of cardiac cycle were taken in anterior view using a multi-crystal gamma camera. In 37 cases, LAO study was followed within 1 hr.

The sensitivity of movie observation was highest for wall motion abnormality. However, the combined study of phase image and regional wall motion image was as sensitive as movie observation.

Phase image in ANT view was better than LAO view to localize the lesion. And standard deviation of the left ventricular phase histogram in ANT view in normal group was significantly lower than LAO view.

From above results, phase analysis in ANT view is clinically useful method for regional wall motion assessment in ischemic heart disease.

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EVALUATION OF RIGHT VENTRICULAR INFARCTION USING FOURIER ANALYSIS. T. Takahashi, S. Katsuragawa, T. Abe, T. Yanagisawa, K. Nakai, K. Matsushita, A. Kawamura and M. Kato. Department of Radiology and 2nd Internal Medicine, Iwate Medical University, Morioka.

Eight cases of right ventricular infarction were studied using Fourier analysis of biventricular radionuclide gated imaging.

The characteristic findings of right ventricular infarction were as follows.

1) By radionuclide gated blood pool images, the value of RVEF were decreased significantly and the right ventricular wall motion showed a- or dyskinesis, that indicated an abnormal contraction sequence in the amplitude scan.

2) By phase analysis for identifying RV wall motion abnormalities, our study indicated an inverse relationship between RVEF and SD of RV phase histogram. But the mean value of RV phase wasn't correlated with heart rate.

In conclusion, Fourier analysis may improve the diagnostic sensitivity for the noninvasive identification of right ventricular infarction by radionuclide ventriculography.

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ASSESSMENT OF PHASE IMAGE: A COMPARISON WITH CONTRAST LEFT VENTRICULOGRAPHY AND ECHOCARDIOGRAPHY. H. Matsuo, H. Shinohara, Y. Koga, M. Katayama, J. Nagashima, S. Masumi, M. Tohaya, K. Harumi. Department of Radiology and Internal Medicine of Cardiology, Showa University Fujigaoka Hospital. Yokohama

Multiple-gated blood pool scan(MG) was correlated with biplane contrast left ventriculography(LVG) and echocardiography(US) in the thirty-two patients with ischemic heart disease. MG was performed in Modified LAO 45 degrees view. Abnormal areas of phase image(PH) of MG was divided into four regions and correlation between PH and wall motion analysis in the LVG and US were examined. In the PH sensitivity and specificity were 85% and 41% respectively. In septal, anterior and posterior areas sensitivity and specificity were low, specificity of lateral area and sensitivity of apical area were high. We cannot found the correlation between abnormal areas of PH and regional wall motion in LVG and US. We concluded that the cause of this discrepancy will be the difference of parameter of PH and conventional wall motion analysis.