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EVALUATION OF RIGHT VENTRICULAR FUNCTION USING FIRST-PASS RADIONUCLIDE ANGIOCARDIOGRAPHY IN PATIENTS WITH RIGHT VENTRICULAR OVERLOAD. A.Sato, A.Suzuki, H.Miyakoda, T.Watanabe, H.Itatsu, O.Ueda*, K.Sakurai*, N.Kawai** and I.Sotobata**. Dept. of Intern. Med. and *Radiology, Nagoya National Hosp., **1st Dept. of Intern. Med., Nagoya Univ. School of Med., Nagoya.

Right ventricular ejection fraction (RVEF) was assessed using first-pass radionuclide angiography in 10 normal subjects and 30 patients with right ventricular overload including atrial septal defect (ASD), mitral valve disease (MVD), primary pulmonary hypertension (PPH) and mitral valve disease with tricuspid regurgitation (MVD+TR). RVEF was significantly lower in patients with MVD, PPH and MVD+TR than in normal subjects (0.58±0.10), but there was not a significant difference of RVEF between the patients with ASD and normal subjects. RVEF inversely correlated in all patients with pulmonary arterial systolic pressure (PASP). In patients with pure mitral stenosis (MS) and PPH, right to left ventricular end-diastolic volume ratio (EDVR) was significantly higher than in normal subjects, and correlated with PASP. With operation, RVEF increased significantly in patients with MVD and MVD+TR, but it decreased in patients with ASD. And then EDVR decreased significantly in patients with MS. In conclusion this technique is useful for evaluation of right ventricular function.

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DETECTION OF ISCHEMIA BY THE PHASE IMAGE OF FIRST PASS RADIONUCLIDE ANGIOCARDIOGRAPHY AT REST AND ON EXERCISE. M.Sawamura, M.Kinoshita, M.Motomura, K.Bito, S.Kawakita, T.Suzuki, E.Yabumoto, K.Masuda, Y.Ikemoto and T.Honda. Shiga University of Medical Science. Shiga.

Phase image analysis was performed on left ventricular (LV) RAO 30° first pass radionuclide angiography at rest and just after exercise, and the usefulness of phase images was examined for the detection of ischemia. Patients were classified as follows; group I with effort angina (9 cases), group II with old myocardial infarction (7 cases), and group III with normal coronary artery (15 cases). LV phase image was divided into apical, anterolateral and inferior segments. We evaluated the difference in the mean of pixel phase values (PM) within each segment of these phase images. In group I, the PM of ischemic segment was significantly more delayed than that of non-ischemic segment (sensitivity: 67%). In group II, the PM of the segment with myocardial infarction tended to be more delayed on exercise. In group III, the PM of all segments was not delayed (specificity: 93%). Phase image was also useful for detection of ischemia in cases with reciprocal ST change.

In conclusion, the sensitivity and the specificity of the phase image on exercise became much higher than at rest only. Thus this method was found to be useful to detect the ischemia of LV image.

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EVALUATION OF FOURIER ANALYSIS FOR MULTIGATED MYOCARDIUM IMAGING. H.Toyama, H.Murata and H.Yamada. Tokyo Metropolitan Geriatric Hospital, Tokyo. Y.Mashima. Tranomon Hospital. Tokyo.

Fourier analysis method for multigated myocardium images was developed and evaluated for a normal control and a hypertrophic cardiomyopathy (HCM). Multigated myocardium images were obtained at 40msec time interval during about 20min after 2-4mCi of Tl-201 chloride solution injection intravenously. The left ventricular myocardium was divided into twelve segments in each frame after automatically edge detection. Time activity curves generated from counts summing in each segment were analyzed by Fourier function. Images of amplitude and phase were displayed with 16 steps color. The high amplitude was shown at the region of good contraction for the normal heart. In a case of HCM, low amplitude was shown in spite of high ejection fraction. This fact indicates that the amplitude is corresponding to the percent wall thickness of the myocardium. Various types of three dimensional dynamic pattern were also generated and their clinical usefulness was evaluated.

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USEFULNESS OF FOURIER PHASE ANALYSIS OF RIGHT VENTRICULAR WALL MOTION IN DETECTING PROXIMAL RIGHT CORONARY ARTERY STENOSIS. Y.Tsuneoka, Y.Ishida, BH.Kim, T.Hiraoka, M.Fukushima, M.Matsumoto, M.Inoue, H.Abe, Y.Nakamura*, H.Omori*, Y.Kusumi*, K.Kimura*. The 1st Dept. of Med. and the Div. of Nucl. Med*. Osaka Univ. Med. Sch. Osaka.

To estimate the usefulness of Fourier phase analysis of right ventricular (RV) wall motion (WM) for the detection of proximal right coronary artery (RCA) stenosis, RV ejection fraction (EF) and phase images were analyzed in 48 patients with coronary artery disease, 23 with (G-1) and 25 without (G-2) proximal RCA stenosis, following multi-gated cardiac blood pool scan at rest (R) and during maximal exercise (Ex). The degree of RVWM abnormality was estimated by standard deviation of phase angles (SDP) within RV. RESULTS: RVEF decreased in 21 of G-1 (91%) and 12 of G-2 (48%) during Ex. SDP increased significantly in G-1 during Ex (11.1±6.2° to 16.1±8.4°, p<0.01). But in G-2 no significant change in SDP was observed between R (8.8±2.3°) and during Ex (9.1±2.1°). Abnormal increase in SDP during Ex (ΔSDP>2.0°) was observed in 17 of G-1 (74%) and in only 3 of G-2 (12%). Specificity (88%) and accuracy (81%) of phase analysis were superior to those of RVEF analysis (52% and 71%, respectively) in the detection of proximal RCA stenosis.

These results indicate that a combined analysis of RVEF and RVWM by phase analysis is necessary in detecting proximal RCA stenosis.