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RADIONUCLIDE EVALUATION OF RIGHT VENTRICULAR FUNCTION IN CASE OF ACQUIRED VALVULAR DISEASE AT PRE AND POST-OPERATIVE PERIOD. Y.Takeuchi, N.Kurata, M.Kaneda, H.Chikusa and M.Kusakawa. Department of Thoracic and Cardiovascular Surgery. K.Takeda, H.Maeda and T.Nakagawa. Department of Radiology, Mie University School of Medicine, Mie.

For the purpose of evaluating the right ventricular function and cardiac reserve, ECG-gated equilibrium radionuclide angiography was performed with Tc-99m-RBC in 11 acquired valvular disease cases at pre and post-operative periods.

We can divide them into two groups. Group-A; its value of right ventricular ejection fraction (RVEF) was not increased by exercise, group-B; its value of RVEF was increased by exercise. After operation, improvement of RVEF and hemodynamics of group-B was delayed especially cardiac output (C.O.) was decreased at early post-operative period. The value of RVEF was almost improved at late post-operative period. The value of LVEF was not appeared significant change.

For evaluating the cardiac reserve and right ventricular function, it is useful to measure the right ventricular ejection fraction during exercise. We can predict the early post-operative states by this method.

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Clinical Application of the Nuclear Stethoscope. -Evaluation of cardiac performance with ergometric stress testing in cardiac disease patients- H.Tomiya, I.Ishide, J.Iwata, C.Sato, F.Hatogai, A.Nakayama, T.Saito and Y.Inagaki. The 3rd Dpt. of Internal Med., Chiba Univ. S.Higaki and T.Nakamura. Department of Medicine, Yokkaichi City Hospital.

The nuclear stethoscope (NS) is an apparatus provided as a safe, noninvasive and repeatable method for determining left ventricular ejection fraction (EF). The EF by NS is reliable and useful for evaluating of cardiac performance at rest and during exercise. In this study, we applied NS to the assessment of cardiac performance with exercise testing in cardiac patients. In 27 cardiac patients and 24 normal healthys, the EF by NS and hemodynamic parameters were measured during the multistage ergometric stress testing the supine position.

As a result, the hemodynamics and EF during exercise was more useful for evaluating the cardiac performance than at rest. And the severity estimated by change of hemodynamics during exercise, almost, paralleled to that by the criteria of NYHA. But, both was not always agreed.

In conclusion, it was revealed that the evaluation of change of hemodynamics and EF during exercise stress testing was useful in evaluating the cardiac performance.

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The Reliability and the Limitation of left Ventricular Ejection Fraction with Nuclear-Stethoscope. Y.Furukawa, K.Yamamoto, T.Fukuda, K.Makita, S.Irie, M.Tonooka, Y.Hino, Y.Sugiyama, T.Saito and Y.Inagaki. The 3rd Dpt. of Internal Med., Chiba Univ. N.Arimizu. Dpt. of Radiology, Chiba Univ.

We reported the reliability of left ventricular ejection fraction (EF) with nuclear-stethoscope (NS) which described left ventricular time activity curve at real time, last year.

In this study, we evaluated the reliability and the limitation of EF, especially lower EF, with NS at rest and during exercise in comparison with gated camera method. We also analyzed the correlation between EF, cardiothoracic ratio (CTR) and stroke volume measured by the dye-dilution method. The result showed that 1) Good correlation between EF measured by NS and gated camera was found ( $r=0.90$   $p<0.001$ ). The lower EF measured by NS was slightly overestimated more than EF by gated camera. 2) During exercise, EF had good correlation between by NS and gated camera ( $r=0.75$   $p<0.001$ ). 3) In patients with CTR more than 50%, the only EF was decreased, but with more than 60%, the both EF and stroke volume were dropped down.

We clarified that NS was very useful for evaluating left ventricular performance not only at rest but during exercise.

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EVALUATION OF LEFT VENTRICULAR DIASTOLIC FUNCTION BY NUCLEAR STETHOSCOPE. M.Kimura, T.Nishimura, T.Uehara, K.Hayashida, H.Ohmine, T.Kozuka, I.Yamada and M.Hayashi. Department of Radiology, National Cardiovascular Center. Osaka.

The Nuclear Stethoscope is able to obtain a high temporal resolution (10ms per data point) left ventricular volume-time curve, the rates and times of filling phase can be easily calculated by the aid of the system's adjustable cursors. We used the Nuclear Stethoscope to assess peak filling rate (PFR) and time to peak filling rate (TPFR) as indexes of left ventricular diastolic performance in 6 normals and 39 patients with coronary artery disease (CAD). CAD patients consisted of three groups without previous myocardial infarction (MI) (Group AP: N=9) and with previous MI, both normal ( $\geq 50\%$ ) ejection fraction (Group MI-1: N=14) and abnormal ( $< 50\%$ ) ejection fraction (Group MI-2: N=16).

1) PFR were significantly depressed in Group MI-2 ( $1.98 \pm 0.69$  EDV/sec:  $P<0.01$ ), but not significantly different between normals ( $2.88 \pm 0.23$ ) and Group AP ( $3.47 \pm 0.62$ ), Group MI-1 ( $3.41 \pm 0.52$ ).

2) TPFR were also not significantly different between normals ( $152 \pm 50$  msec) and other groups (Group AP:  $180 \pm 25$ , Group MI-1:  $162 \pm 43$ , Group MI-2:  $165 \pm 70$ ).

3) In these all patients, ejection fraction and PFR correlated closely ( $\gamma=0.88$ ).