

157

MANGANESE-52m FROM Fe-52/Mn-52m GENERATOR: A POTENTIAL AGENT FOR MYOCARDIAL POSITRON IMAGING. F.Shishido, Y.Tateno, K.Suzuki, T.Ido, and Y.Suda. National Institute of Radiological Sciences, Chiba.

Manganese is known to localize in mitochondria which are abundant in myocardium. Manganese-52m obtained from Fe-52/Mn-52m generator was investigated as a potential myocardial positron imaging agent.

Fe-52 was produced from Mn-55(p,4n)Fe-52 reaction, and Mn-52m was separated from the generator by hydrochloric acid. Organ distributions of Mn-52m in rabbits were examined chronologically by autopsy and/or positron imaging using a multicrystal positron camera.

Myocardial-to-liver ratios were 0.76 at 40 min. after intravenous administration and 1.17 at 106 min. after the injection. The image of the heart at 20 min. after injection was faintly revealed. At 28 min. the myocardial image was visualized more clearly, and at 90 min. the image of the heart was clearly shown.

These preliminary result suggested that manganese-52m was hopeful as a myocardial positron imaging agent which was able to be obtained from a generator.

158

CLINICAL EVALUATION OF RADIONUCLIDE CARDIO ANGIOGRAPHY USING SLANT HOLE COLLIMATOR. M.Hayashi, T.Nishimura, M.Kagawa, Y.Imai, T.Uehara, T.Kozuka, National Cardiovascular Center, Nuclear Medicine and Cardiology.

In radionuclide angiography, the separation of cardiac chamber is troublesome problem because of conventional collimation. In this study, radionuclide angiography with angled view which can separate LA and LV were clearly performed using slant hole collimator (30 slant with 7000 holes). In 20 patients with cardiac diseases, these methods were studied in comparison with conventional angiography. In all cases, the cardiac chamber were well separated than conventional method in the position of modified LAO.

For calculation of ejection fraction (EF), slant hole EF was compared with conventional EF using camera-computer system. Slant hole EF was well correlated with conventional EF (0.94) and slant hole EF is slightly higher than conventional EF because of separation of LA, LV and background areas. As the slant hole collimator was closely to the body surface than conventional collimator, segmental wall motion was clearly detected in all cases, especially in the apical region.

159

THE EVALUATION OF LEFT VENTRICULAR PERFORMANCE BY THE NUCLEAR STETHOSCOPE. M.Noguchi, H.Murata, M.Iio, S.Kawaguchi, E.Ohtake, C.Tobari, K.Chiba, H.Yamada and K.Ueda. Department of Nuclear Medicine and Radiological Sciences and department of Medicine, Tokyo Metropolitan Geriatric Hospital. Tokyo

The left ventricular performance was evaluated using the nuclear stethoscope (Bios). The nuclear stethoscope was composed of three parts, one as 2 inches single probe which was controllable to any directions one as microprocessor which calibrated and calculated the volume curve and EF of the left ventricle, and one as CRT displaying the results at real time automatically. After bolus injection of 5-20mCi of Tc-99m-HSA or Tc-99m-RBC, the first pass method and following the equilibrium method could be performed. In this system, two modes were prepared to analyze beat by beat and composite beat basis. The population studied was as follows, 6 myocardial infarctions, 5 arrhythmias, 1 angina pectoris, 2 normal volunteers and 2 others. The analysis of arrhythmias such as AF and VPB carried us to know that the longer the R-R intervals became, the more the EF of the following ventricular contractions became. In the case of angina pectoris, the EF during stress had remarkably decreased than at rest. In conclusion, the reproducibility in EF was good and left ventricular performance was evaluated easily by the nuclear stethoscope.

160

CLINICAL APPLICATION OF NUCLEAR STETHOSCOPE FOR CARDIOVASCULAR NUCLEAR MEDICINE. T.Nishimura, T.Uehara, M.Hayashi, M.Kagawa, Y.Imai, T.Kozuka. National Cardiovascular Center, Cardiology and Nuclear Medicine, Osaka.

Quantitative evaluation of left ventricular performance is considered to be one of the most useful tools in routine and critical cardiac patients diagnosis. The Nuclear Stethoscope (N.S.) (BIOS) is a unique cardiac probe that provides a precise, rapid, noninvasive method to directly quantify ventricular function at the bedside, or actual beat-to-beat or composite beat basis.

The accuracy and validity of N.S. were studied in 42 patients with cardiac diseases in comparison with camera-computer EF. The N.S.EF. was well correlated with camera-computer EF ($r=0.82$), and 17 patients with cardiac catheterization, contrast EF was well correlated N.S.EF ($r=0.78$), while, the correlation coefficients of camera-computer and contrast ef. was 0.89. The N.S.EF. would be available for routine work noninvasively.

In this study, clinical application of N.S. for cardiovascular nuclear medicine was as follows.

1. beat-to-beat left ventricular volume response for evaluation of arrhythmias (atrial fibrillation, premature ventricular conduction, bigeminy etc)
2. exercise testing, EF is an extremely sensitive indicator of cardiac diseases. N.S. is useful for Handgrip and Ergometer test.