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CLINICAL EVALUATION OF USEFULNESS OF Tc-99m-SPECT IMAGES. I.Nakada, E.
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Single photon emission tomography (SPECT) using Tc-99m-pyrophosphate (PYP)
was performed in 47 patients, with acute myocardial infarction (AMI), 6 with
cardiomyopathy (CM), and 6 with ischemic heart disease (IND), all of whom complained
chest pain. Data for SPECT were collected from 180 degree from RA O to LP O of
the patients, and then reconstructed by filtered back projection method. We used
Wiener filter as a pre-filter, and no attenuation collection was done. Myocardial
uptake of Tc-99m-PYP was clearly separated from uptake of rib or spine and more
delineated in SPECT than in conventional Planar image. Sensitivity of moderate
and severe rejection (TBI) was high, however, it was not detected in mild rejection.

Identification of infarcted area and size in acute myocardial infarction is a
important factor to determine the prognosis. We evaluated the availability of
Tc-99m HMPD (20m Cl), which was injected intravenously to the patients at 1-4
days from onest, compared with Tc-99m PYP. Sensitivity and specificity between
HMPD and PYP groups were almost similar statistically. To evaluate the speciality
of HMPD, uptake ratio in sternum, rib, and soft tissue were calculated at 2 and 3
hour after intravenous injection, HMPD photo could be imaged in the early time
relatively. Furthermore, planar images and SPECT images were analyzed to deter-
mine the infarcted area compared with other parameter.

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ASSESSMENT OF SEVERITY OF CARDIAC REJECTION
IN HETEROTOPIC HEART TRANSPLANTATION USING
INDIUM-111 ANTIMYOSIN AND MAGNETIC RESONANCE
IMAGING. T.Nishimura, M.Hayashi, T.Uehara, K.
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It is important in heart transplantation to evaluate precisely the severity and
extent of cardiac rejection. Seven donor hearts in which atrial septal defect and
tricuspid regurgitation had been produced beforehand, were heterotopically transplant-
ed into the recipient's chest cavity. Indium-111 antimony myocardial imaging of
the excised heart was performed using scinticamera. Magnetic resonance imaging was
also performed and T2 relaxation time was calculated. Then, these data were correlated
with pathologic findings such as mild, moderate and severe rejection. Indium-111
antimony uptake was high in moderate and severe rejection, but T2 relaxation time
was prolonged even in mild rejection. Thus, Indium-111 antimony uptake was specific,
and T2 relaxation time was sensitive for detection of cardiac rejection. These non-
invasive procedures allow us to evaluate accurately myocardial tissue characteriza-
tion in cardiac rejection.

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CHARACTERIZATION OF 99mTc-hexakis-ether isonitriles
FOR MYOCARDIAL PERFUSION IMAGING.
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A number of 99mTc-hexakis-isonitrile analogs appear to be useful for myocardial perfusion
imaging. The first isonitrile studied in humans (t-butylishonitrile, TBI) was non-mean due to high
lung and liver background activity. A series of isonitrile derivatives have been synthesized and
studied in animals to select analogs with more favorable characteristics. The most promising
class of compounds which have been identified are the aliphatic (C-4 to C-5) methyl ethers. These
compounds exhibit good initial heart uptake with different clearance rates, rapid blood clearance,
low lung extraction, and rapid liver clearance. Of these, Tc-99m-hexakis-2-methoxy methylpropy-
lishonitrile (99mTc-RP-30) is superior in terms of overall imaging characteristics. The heart
extraction is rapid and retention of 99mTc-RP-30 persists with a t1/2 of ~5 hours. The activity
and clearance of 99mTc-RP-30 in the liver yields an increasing heart/liver ratio with increasing
time after injection. This agent distributes in the heart initially in relation to regional
myocardial blood flow. In rabbit coronary artery ligation release studies, 99mTc-RP-30 does not
redistribute while 201-T1 shows an apparent redistribution of 40-50%. The pharmacological
characteristics of 99mTc-RP-30 are consistent with preliminary clinical studies. These studies
suggest that 99mTc-hexakis ether isonitriles may be clinically valuable for myocardial perfusion
and functional measurements.