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QUANTITATIVE ANALYSIS OF THE IMAGE WITH MULTI-GATED SINGLE PHOTON EMISSION CONPUTED TOMOGRAPHY OF THE CARDIAC BLOOD POOL(THREE DIMENSIONAL DYNAMIC PATTERN). Y.Mashima, F.Nagasaki, S.Nakanishi, H.Murata & H.Toyama. Toranomon Hospital and Tokyo Metropolitan Geriatric Hospital, Tokyo.

In order to analyze detailed contraction pattern of the left ventricle(LV), we developed three dimensional quantitative analysis of LV blood pool and evaluated this method on detection regional wall motion abnormalities. With ZLC 7500 & scintipac 2400 system, tomographie images of the LV blood pool in coronal section were reconstructed from gated SPECT images. In each coronal section of LV, edge detection was performed in isocount level and contour of LV was created. Using ventricular contour of each contraction phase, various parameters indicating ventricular wall motion were created and evaluated as follows

1) sequential changes of LV contour in each contraction phase.
2) locus of the centers of ventricular coronal section in sequential contraction.
3) Amplitude & phase values were calculated with Fourier analysis in each coronal section & functional images was obtained.

Three dimensional analysis of ventricular blood pool was thought to be usefull to observe detailed ventricular contraction.

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DEVELOPMENT OF INTELLIGENCE PROGRAM FOR AUTOMATIC DIAGNOSIS OF CIRCUMFERENTIAL PROFILE AND ITS APPLICATION TO Tl-201 MYOCARDIAL SHORT-AXIAL SPECT. H.Bunko, A.Tada, K.Nakajima, J.Taki, I.Nanbu, N.Tonami, K. Hisada and K.Kojima. Kanazawa University Medical School. Kanazawa.

Quantitative diagnosis using circumferential profile (CFP) is widly used for Tl-201 myocardial imaging and has a good reproducibility. However, its diagnostic efficiency is susceptible to the number and composition of the normal (N) group. Purposes of this study are 1) to develop intelligence program for automatic diagnosis of circumferential profile (CAD) and 2) to evaluate its diagnostic and usefulness for quantitative diagnosis of Tl-201 myocardial short-axial SPECT according to the number of Ns. CAD is consisted of 4 functions: (1) data filing, (2) change and correction of file data, (3) automatic diagnosis of CFP and (4) file data review. These functions are performed by selection of function switch under control of main routine. When function (1) or (2) are performed, new diagnostic criteria (mean-2SD) is generated automatically using N data in the data base at that time. Because of this function, diagnostic criteria is changeable according to the number of Ns. Sensitivity and specificity of CAD for Tl-201 7-pinhole images in 16 Ns and 17 IHDs were 100%, 44% (N=4), 88%, 94% (N=8 or 16) and 88%, 100% (N=12), respectively. In conclusion, intelligence program is necessary for automatic diagnosis using quantitative criteria under the condition of daily increasing informations. Automatic diagnosis of CFP using intelligence program "CAD" is simple, effective and useful for interpretation of Tl-201 myocardial short-axial tomography. "CAD" is applicable to any quantitative distribution study using CFP.

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SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY OF THE HEART USING THALLIUM-201. Harvey J. Berger. Yale University school of Medicine. New Haven.

Our initial experience with ECT imaging of the myocardium with THALLIUM-201 is reviewed. Data on rest and exercise studies will be presented. New methods of quantification of this tomographic procedure are compared to conventional quantification programs for planar THALLIUM-201 images. Technical considerations are discussed.

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POTENTIAL INTERACTION OF NMR AND NUCLEAR MEDICINE IN CARDIAC IMAGING. Harvey J. Berger. Yale University School of Medicine. New Haven.

NMR imaging allows for visualization of the heart with excellent spatial resolution. Cardiac motion can be minimized by special gating techniques. NMR provides information concerning tissue characterization (relaxation time) as well as morphologic data. New direction include in vivo spectroscopy and imaging of atherosclerosis. The physiologic parameters ovtained from NMR will be compared to those of radiotracer methods.