
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, tomographic 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 and 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 useful to observe detailed ventricular contraction.


Quantitative diagnosis using circumferential profile (CFP) is widely used for T1-201 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 T1-201 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 in T1-201 T1-201 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 T1-201 myocardial short-axial tomography. "CAD" is applicable to any quantitative distribution study using CFP.


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.