

Simultaneous Display of Sequential Cardiac Images and ECG-Curve
A Type of ECG-Synchronized High Temporal Resolution Radionuclide Angiocardiology

A. KASAHARA, H. HASHIBA, T. HASEGAWA, K. ASANO, T. FUJINO, S. YOKO-O

Dept. of Radiology, Kori-Hospital of Kan-sai Medical University

M. YAMAGUCHI, T. SIMOGAMA, J. IWASAKI

Toshiba Medical Co.

Anger-type camera and ECG-signal were connected through an interface into 16 KB minicomputer (byte-machine) with 4.8 MB disc. After intravenous bolus-injection of ^{99m}Tc HSA counts from the camera and ECG-signal were fed into the disc through two ADCs and minicomputer with list mode data acquisition format. As a timing pulse 10 millisecond was selected for separating x, y position data information and digitalized ECG-voltage information. Eight-bit ADCs permitted 160×160 data point spatial resolution for $22 \text{ cm} \times 22 \text{ cm}$ detector-field. After completing data acquisition sequential cardiac images and ECG-curve were reconstructed by the computer; minimum-visualized cardiac image was 40 millisecond per frame. Reconstructed cardiac images and ECG curve were simultaneously displayed on the CRT of the computer. Moreover, certain part of the ECG curve was enhanced corresponding to each

cardiac image, and permitted us to recognize electrocardiographically the exact location within one cardiac cycle being comparable to each cardiac image. Fifteen minutes after the bolus-injection of the radionuclide, ECG and counts from the left ventricle viewed from LAO 45 degree were collected into the disc with list mode data acquisition format. Thereafter, a region of interest (R.O.I.) is defined around the left ventricle at end-diastole, and then counts in the ventricle repetitively and successively were summed up every 10 millisecond between R-R-interval of the ECG for 100 heart-beats. The background was subtracted in such a way that a region both in the ROI and except the true ventricle was cut off at certain level, which was determined from a profile or oblique image of the sufficiently superimposed heart-images at end-diastole. Thus, background-corrected left ventricular volume curve was obtained.

Effect of Time Interval and Dead time in the Quantitative Measurement of Cardiodynamics.

H. SHIDA

Dep. of Radiolog. Rosai Hospital for Silicosis

In the high speed dynamic study, the count loss is remarkable increasing high count rate, esp. in the level of 3000 cts/0.1 sec. is 30% with 4μ sec. dead time gamma camera.

Concerning ejection fraction the time interval 0.2 sec underestimates from 2~40 comparing with 0.1 sec.