

Sequential and Simultaneous Display of Both Functional Curves of Physiological Gical Events and Radionuclide Angiocardigraphy

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It was reported at the 15th Annual Meeting of the Japanese Society of Nuclear Medicine that the 'Simultaneous Display of ECG and Radionuclide Angiocardigraphy' was developed by us. In this presentation, furthermore, intracardiac pressure-curves of both ventricles were displayed sequentially and simultaneously with radionuclide cardiac pool-images of a canine heart. Toe-Plethysmographs were also done with the use of ^{99m}Tc -pertechnetate images on the bottom of a human feet. And, finally, 'simultaneous and sequential displays of four physiological curves, (including two ECG-leads, finger plethysmograph and breath-curves), and radionuclide angiocardigraphy of a man' were presented.

The method used was as follows: Together with signals from Anger camera, analog-signals from detectors for extracting human physiological events were multiplexed and transferred into AD-converter in an interface. The digitalized data of

physiological events were sequentially fed into a 16K-byte minicomputer with the data from Anger camera, which were interrupted by those of physiological events every 10 milisecond. The data-acquisition into the computer was done by a list mode. Many physiological events (except very high frequency signals such as phonocardiography) could be sequentially and simultaneously displayed with their dynamic radionuclide organ-images. The dynamic detector-CPU response of our system was 75%, with CPU counts that correlated linearly to Anger-camera-scaler counts of 12,000 cps. The image quality of our system's display was excellent with images of less than a hundred milisecond per viewing frame. Our system could display a dynamic image of 160×160 matrix-display, and physiological curves on each display-frame from 0.01 to 0.50 sec time-interval, and make 48 display-frames in seven minutes as one display-job of the minicomputer.

Radioisotopic Dynamic Study of Assessment of Peripheral Obstructive Arterial Disease

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We have reported the time activity curves after injecting an intravenous bolus of 10 mCi of ^{99m}Tc pertechnetate during reactive hyperemia in calves, feet, and hands by using a Pho/Gamma III with a video-tape recorder playback system. We have also reported the correlation between those time activity curves, and 1) the sites of occlusive lesions which were proven by arteriography and 2) grades of intermittent claudication of the calves.

From April 1976 through October 1976, 30 patients with insufficiency of the hands, calves or

feet underwent this examination. We employed our large-field of view scintillation camera, and NOVA 1200 computer system. Due to the importance of ROI when analyzing the pathophysiology of Buerger's disease, we paid special attention to the evaluation of the time frame histogram of the ROI of the hands and feet.

In normal limbs the time frame histogram ("TFH") showed a marked peak at the first phase, but in abnormal limbs the "TFH" showed a gradual upward slope. The first phase of these time histograms was calculated by gamma function