ECG GATED CARDIAC IMAGING OVER THE CARDIAC CYCLE WITH GAMMA IMAGER

C.Hidaka[*], S.Matsumoto[*], S.Murakami[*], and T.Nakai[*], H.Ochi[**], K.Ikegaya[***], N.Fujikawa[****]
Department of Radiology, Nissei Hospital, Osaka,[*] Department of Radiology, Osaka City University Medical School[**], Kansai Branch, Toshiba Medical Systems Co., LTD.[***] Fujitec LTD.[****]

A new method of obtaining scintiphotos of the cardiac blood pool image for the study of ventricular wall motion was reported. The method which is based on a inexpesive modification of a commercial multiformat imaging device (Gamma Imager),yields a set of serial gated images covering the entire cardiac cycle.

In its usual mode of operation, the gamma imager records 1, 4, 6, (12), 25, 48, or(80) images on an 11x14-inch films. ECG and gate signal of the patient are recorded on the first frame. The number of images to be recorded is selected, and also exposure time (usually 50 to 60 msec) in each frame is selected freely.

The system was tested using a small ^{99m}Tc-source mounted on a 72-rpm photographic turntable. The images of the moving source clearly show that the source has been imaged in all phases of its rotation.

Cardiac blood pool images of several patients were obtained using ^{99m}Tc-labeled human serum albumin (15 to 20 mCi). We could observe the movement of the left ventricle clearly. It takes about 200 to 300 cycles (3 to 4 minutes) to make one series of cardiac blood pool images.

This technique was applied to the ^{201}Tl-Cl myocardial imaging (1.5 to 2 mCi). In myocardial imaging, it takes 1000 to 1200 cycles (14 to 15 min.) to make one series of image.

This communication describes a new method of producing gated cardiac blood pool images and myocardial images which is inexpensive to implement, simple to use, clear in image, and which immediately produces of serial images covering the cardiac cycle.

STUDY ON THE VARIANCE IN THE SHAPE OF A LIVER IMAGE INDUCED BY RESPIRATION

Shigemichi Yonamine, Shigeru Chiba, Hinako Toyama, Kazuo Chiba, Hideo Yamada, Hajime Murata Shinichiro Kawaguchi, Akira Kodera, Masahiro Iio
Department of Nuciear Medicine and Radiological Science Tokyo Metropolitan Geriatric Hospital

Using gamma camera computer system,liver mortion induced by respiration was measured quantitatively in normal and diseased liver. After intravenous injection of 10 mCi of ^{99m}Tc -phytate, 30 frames of image were obtained at the time interval of 0,5 second durng normal and forced respiration, respectively in anterior, supine, and left decubitus projection. A time activity curve was obtained from the region of interest selected on the liver edge and liver image coresponding with maximum respiration and inspiration were obtained. Then the outline of these liver images were generated automatically and compared each other. In normal case, an amplitude of time activity curve during forced respiration was three times larger than that of during normal respiration. In the anterior projection, upper portion of the liver image shifted about 0.5cm and lower part of the liver about 1cm by normal respiration,however, larger displacement of the liver image was obtained 1.8cm in the upper edge and 3.5cm in the lower part. In a case of liver cirrhosis, displacement was 1.1cm and 1.5-2.6cm at upper, lower edge respectively both normal and forced respiration. In a case of metastatic liver cancer, respiratory movement of liver was not obserbed. Right lateral view of the liver showed different respiratory change at the supine and the left decubitus position.

In conclusion, using gamma-camera computer system and automatic liver edge detection method, variation of liver shape by respiration was compared quantitatively normal and diseased liver cases at various patient's position compared with normal case,patient with liver disorders showed different result.