THE EVALUATION OF LEFT VENTRICULAR DIASTOLIC FUNCTION WITH FOURIER TRANSFORMATION ANALYSIS. S. Masumi, Y. Koga, M. Katayama, Fujigaoka H. Showa Univ. Yokohama

There are few reports of the study of late diastolic phase by RN study. In arrhythmia LV volume curve by conventional ECG gated multiple blood pool scan (MGS) are inaccurate as far as from synchronized R wave. In this report to evaluate the late diastolic phase function in ischemic heart disease by new technique that enables acquire the MGS reversed synchronized to R wave in image mode neglecting the irregular pulses. In ischemic heart disease R-wave reverse gated MGS was quantitatively analyzed at 10ms interval to evaluate the rate of LV filling during the time of atrial contraction. When corrected for EDV, atrial-dV/dt/EDV was significantly depressed (1.6±0.69) and Matrial-dV/dt/EDV was higher than max. dV/dt/EDV at rapid filling phase (mean value 1.10±0.53) in patients with large myocardial infarction size estimated by TL. In conclusion Reverse gated Multi-buffer MG are useful technique to evaluate the LV diastolic function during the time of atrial contraction.

FREQUENCY CHARACTERISTICS OF TEMPORAL FILTER USUALLY USED IN CARDIAC ECG-GATED BLOOD POOL SCINTIGRAPHY. Y. Futamura, T. Furuta, K. Sakurai, M. Senda, Dept. of Radiology, Meitetsu Hospital, M. Senda, Dept. of Radiology, Meitetsu Hospital.

It is important to utilize an adequate temporal filter to analyze the information involved in ECG-gated blood pool scintigram. The purpose of this study is to determine the frequency characteristics of the usually used temporal filter. Filters studied in this report are following: 1) 3rd order Butterworth filter, 2) Multifilter, 3) Contour filter, 4) Band-pass filter, 5) Notch filter, 6) High-pass filter, 7) Low-pass filter. By frequency response of digitalization, amplitude ratio of input and output sinusoidal wave (I/o) was almost flat from DC to 1/8fo. Above 1/8fo, I/o was oscillated. Filter II has the ability to eliminate this oscillation effectively and I/o was 0.9 at 1/8fo. Using filter II, I/o was 0.9 at 1/4fo and differential characteristic was excellent in comparison with other differential filters. Filter II and IV were able to be utilized in normal subject without the effect of the sampling noise. In most of instances with congestive heart failure, only three to four harmonics were able to be used because of relatively low signal to noise ratio. It was suggested to be important to select adequate temporal filters according to the purpose of analyzing the gated study.

QUANTITATIVE ASSESSMENT OF LEFT VENTRICULAR REGIONAL WALL MOTION BY NEW MATRIX DIVISION METHOD WITH VARIABLE CO-ORDINATE SYSTEM. R. Futatsuya, H. Seto, T. Kamel, H. Hakishita and J. Yamashish, Toyama Medical and Pharmaceutical University, Toyama.

Quantitative assessment of left ventricular wall motion has been done, using time-activity curve of fixed matrix. However in this method, the part of left ventricle visualized through one matrix is not constant through cardiac cycle because of its contraction. Moreover matrix time-activity curve is not parallel with regional motion of the specific part of the wall accurately, and increase of regional ejection fraction and delay of phase value in the peripheral regions are seen.

We divide left ventricle by variable co-ordinate system based on ventricular edge and aortic valve plane. Though accurate ventricular edge detection is critical in this method, we used first-pass cardiac data with a multi-crystal camera whose statistical accuracy is high and background count is low. From comparative matrix counts through cardiac frames, time-activity curves parallel to the specific parts of the wall were generated. Some type of functional images were also generated and compared with functional images by fixed matrix method. Parameters of time-activity curve by this matrix division method of regional wall motion can be compared more accurately than conventional fixed matrix method.