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DETECTION AND QUANTITATION OF LEFT-TO-RIGHT SHUNTS BY HOMOMORPHIC FILTERING. T.NAGASAWA, M.NAKAMURA,T.TAKAHASHI,M.SUGIWARA,Y.SUZUKI. School of Medicine,Tokai University Isehara.

A method for detection and quantitation of left-to-right shunts is presented and applied to the data from 39 patients with left-to-right shunts and from seven normal patients. Pulmonary time-activity curve from radionuclide angiocardiography is decomposed into the primary circulation curve (Cp) and the first recirculation curve (Cr) by homomorphic filtering. First left-to-right shunts are detected by using the following: Mean transit time ratio of the two decomposed curves; Difference between the time at maximum of Cp and the appearance time of Cr; The ratio of the maximum value of Cp to the value at crossing point of the two decomposed curves. Second, pulmonary-to-systemic flow ratios (Qp/Qs) are calculated from the two areas of the decomposed curves and compared with those from cardiac catheterization. Linear regression analysis gave the following value: r=0.92,regression line slope=1.18, and intercept=-0.31. It is considered that homomorphic filtering method is useful for detection and quantitation of left-to-right shunts. However, it is a sbject of further study how to select the characteristic of a filter used.

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IN RADIONUCLEIDE ANGIOGRAPHY CALCULATING ELLIPTIC REGION OF INTEREST USING A COMPUTER SYSTEM. S.Yoshioka, K.Yamada, S.Endo,J.Hatazawa,T.Matsuzawa and Y.Sasaki. Dept. of Radiology & Nuclear Medicine, The Research Inst. for Tuberculosis & Cancer,Tohoku University and Sasaki Hospital. Sendai and Furukawa.

Left ventricular ejection fractions were determined from radionucleide angiography by means of a computer program. In this program a left ventricular region of interest was defined as the ellipse, which approximately calculated from an isocount contour by method of least squares, for exclusion of uncertainty on the lateral edge and on the valve plane edge. The ejection fractions obtained by computer-linked radionucleide method were comparable to those obtained by generally used radionucleide method in the 12 patients with an r=0.92.

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CLINICAL EVALUATION OF SUBTRACTION-PROCESSED IMAGE OF RADIOISOTOPIC ANGIOGRAPHY. K.Senda, T.Sasaki,A.Mishima,K.Matsubara,H.Kobayashi, O.Kaii,T.Ishiguchi,S.Ohshika,Y.Kodama,S.Okae and S.Sakuma. Department of Radiology,Nagoya University School of Medicine. Nagoya

The clinical usefulness of subtraction-processed image of radioisotopic angiography was eveluated in comparison with conventional radioisotopic angiogram. Radioisotopic angiography performed with usual procedure obtained sequential 120 to 240 frames of image at 0.2 to 1.0 second intervals. Subtrahend and minuend images, the latter of which showed a radioisotopic distribution peripheral in flow phase after injection to the one of the former, were prepared by addition processing by means of referring to time-activity curves of several regions of interest. Then, subtraction-proccessed image was obtained by subtracting subtrahend from minuend image after the subtrahend image was processed with a factor culculated from counts in the same region of interest in both images for the purpose of reducing artifact image araising from excessive subtraction. Consequently, images obtained demonstrated optional region of blood flow area with narrow destribution of radioisotope and very low bach-graund around the region. And, the image could showed accurate finding for diagnosis of heart disease or malignant tumor in all of 20 patients studied more clearly than conventional radioisotopic angiogram.

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FOUNDAMENTAL EVALUATION OF 4 CHANNEL RADIOIMMUNOASSAY COUNTING SYSTEM. A.Ishibashi,Y.Yamagishi,Y.Takahara,Y.Sasaki,S.Yamashita,H.Masaki,Y.Yonahara,Y.Ando,M.Kumamoto,H.Saimura and H.Sakamoto. The 2nd Tokyo National Hospital,Keio University School of Medicine and Hitachi Medico Co.. Tokyo and Kashiwa.

With increasingly frequent request for a large number of radioimmunoassay,it require to preparate in a limited short time, For these request,the Hitachi 4 Channel RIA Counting System(RMA-4A) has been designed specifically for the expanding needs in this field. A NaI crystal with a side through-hole serves as radiation detecter. It is located above the sample changer, and individual samples are elevated in to it. Counting 4 samples at once and changing samples faster by moving the elevater results in a considerable time saving for large sample numbers.

Under the condition from $IxIO^6$ counts to $IxIO^3$ counts, the counting efficiency of four detectors can be determined with good accuracy and stability.

The calculated values in each 4 detectors are in good-statistical agreement with those theoretical values, when these correcting coefficients for 4 channels are estimated (A:I.0264, B:I,0000, C:I,0I[illegible], D:I,[illegible]).