30 and 100 (71×71 matrix and effective area is about 24.4×24.4 cm).

(4) The outer diameters of the lesions were between 1.2 and 3.5 cm, and wall thickness was 0.1 cm.

(5) The uniformity within the firld of interest was confirmed to be ±5% or better and the energy window used was 10%.

(6) Average of total counts of the images was 18,400±1,200 counts.

An suitable processing techniques and display method was applied to the digital scintigrams in each institute and the displayed images were read by plural observers. The results of reading was recorded on work-sheet as position co-ordinates of the recognized lesions and rating of the observer's confidence in five levels. These were sent to IAEA.

Some results of the intercomparison arrieve on the simposium of IAEA at Oct. 24, 1976 as following;

(1) While there may still be considerable disperson in the results obtained by different observers with same techniques, those evaluating with different techniques is considerably greater.

(2) When digital techniques are used for evaluations, the results obtained with processed data are superior to those obtained with unprocessed data, but display methods may have a greater influence on the evaluations.

(3) The results obtained with medium-frequency enhancing filters are in general superior to those obtained by simple smoothing filters, however, in case of lower S/N images, the results of the two pocessing methods were almost same.

Computer Aid for The Removal of Influence of Respratory Movement on Liver Imaging by Gamma-Camera

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The purpose of this paper is to reduce the influence of respiratory motion on the liver imaging by using scintilation camera and computer system. Two hundreds frames of liver image which was consisted by 64×64 pixcels were obtained at time interval of a second. After smoothing each image by points averaging method, ROI was selected in the marginal region of the liver and the time activity curve of this region was generated. From this time activity curve, upper level, corresponding with expiration phase, and lower level, corresponding with inspration phase, were defined as threshold levels. Some files having higher counts than upper level were picked up and summed up, to construct the expiratory phase image. Some files having lower counts than lower level was also picked up to generate the inspiratory phased image. These two phased images were compared with conventional image regarding displacement and deformity of the liver image using contour line method which was determined from gray level histogram.

By this method, liver phantom was analysed which was moved at 16 cycles per minute with a motion amplitude of 3 cm. As a result, the displacement due to mechanical movement of the phased image was corrected as 2.2 cm. After administration of ^{99m}-Tc-phytate, the time activity curve of liver movement was obtained at both level normal, and the ratio of difference between upper or lower level was culculated. In the normal case which had respiratory movement, the ratio was 40%. On the other hand, the ratio were 16% in polycystic liver and 10.5% in liver tumor. In the normal case with forced respiration, the ratio became twice of that of conventional respiration. Moreover, different shapes of the liver were noted in expiratory and inspiratory phases. In conclusion, respiratory motion of normal one of case with SOL due to elasticity of normal liver tissue.

In the past breath hold method has been used to reduce respiratory movement of liver after larger doses administration of radioistope. However, this method is not feasible to the aged

people who asvally cannot hold breath. Our present method does not require both holding breath and large does of radioisotope, and proves to be useful to the effect of respiratory movement on the liver imaging.

Computer Assisted Report in Liver Scintigraphy (RABUPORT)

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Using a TOSBAC 40 time sharing computer and a keymat editor (DTZ 0008A), we are developing the system to make the report in nuclear medicine. For the use of reporting liver scintigraphy we registered 80 sentences and terms although a keymat is able to contain 120 items. Most sentences have a blank or two where a radiologist fulfils with a proper term. The order of registered items is according to the order of entering sentences generally. Therefore, the sentences used for procedure are registered first, and then the sentences for interpretation, diagnosis, differential diagnoses and recommendations are recorded. As for the terms, anatomical words are registered first, and then the names of radio-pharmaceuticals, the terms of interpretation, diagnosis and so on. Finally by ordering printing the computer prints out the necessary number of reports automatically.

We realized now that the system can improve the speed of reporting, save man power, and standardize report, but inevitably we have to take care of computer and tolerate the restrictive form of the reports and the change of daily work in the Department of Radiology.

Modeling and Parameter Estimation of I-131 Rosebengal Kinetics in Hepatic Disorders (2nd Report)

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A new processing technique for the kinetics of I-131 Rosebengal hepatograms has been developed by using a digital computer. A two-compartment model is presented by applying hepatogram analysis to the time-lag between the accumulation of the tracer in the hepatic cell pool and the intrahepatic bile duct pool.

Structural identifiability of the model is investigated by making a comparative study between the rate constants as derived from the measured curve (Hitachi EDR-400) and those derived from a simulated curve obtained by using a middle-sized computer (NEAC 2200–150, 48 KB).

The following results were obtained:

1. Different characteristic accumulation-excretion curves for the right and left lobes and the porta hepatis region, respectively, were obtained.
2. In chronic hepatitis and cirrhosis, the intrahepatic turnover time of the dye was longer than in normal subjects.
3. The intrahepatic bile duct Appearance Time correlated well with the parameter value derived from the combined results of laboratory tests. $r=0.84$ ($P<0.01$).