

A COMPUTER FILING SYSTEM OF PROTOCOLS FOR SCINTI-
GRAPHIC INTERPRETATION OF LIVER AND SURGICAL FINDING
OF THE LIVER

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A computer data-base system of liver scintigram with confirmed diagnosis has been developed for detecting SOL in liver scans more exactly. The purposes of the system can be classified to three categories as such as (1) the information of interpretation from the liver scintigram to be examined (2) the information of surgical operation finding of liver for the same patient and (3) static digital image of 64 x 64 matrix stored onto magnetic tapes.

One hundred and six patients treated between Mar. and Oct. 1977 were registered by computer up to Jan. 1978 and several results were obtained from the system as following :

- (1) The topographical sites of primary tumor were stomach (71 patients, 67% to total patients), esophagus (20, 19%), rectum (8, 8%), sigmoid colon (3, 3%) and others (4 cases), respectively.
- (2) Liver metastasis were found in 14 cases (13% to total) and the true positive cases from scintigram interpretation were only 6 including equivocal (43% of true positive). On the other hand, the false positive were 12 cases (13% of normal liver) including equivocal.
- (3) Number of false negative was 8 cases and 4 cases out of them were only one metastatic cancer of which the size was equal to or less than 10 mm in diameter. The rest of them were uniformly scattered on each sites of liver with size of 10 to 20 mm in diameter.
- (4) Forty-seven static images were processed by a suitable filtering technique, displayed as an iso-count contour map and read by some physicians. The results of their answers were analyzed with ROC curve by computer, but they were not significantly better compared with the scintillation interpretation by polaroid film, because an iso-contour map method may not be suitable to the display of liver scintigram.

CONTINUOUS MEASUREMENT OF RADIOACTIVITY OF XENON-133
GAS IN THE RAT EXPIRED AIR

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A radioactivity inert gas, xenon as useful radio-pharmaceuticals, has been widely employed in clinical diagnosis, particularly for the study of such as blood flow and organ lipid content due to its relatively low solubility in water and is very soluble in fat. Another advantage of using xenon is that it has high partition coefficient between tissue and blood.

Utilizing the above mentioned physical properties, the clinical usefulness of radioxenon respirometry for diagnostic technique was studied.

Male Donryu rats, aged 8 to 15 weeks, weighing approximately 200 to 300g, were used. Three groups of 3 male rats were prepared. One group was for control, another was a typical model group of the experimental fatty liver caused by 0.04 ml of 50% CCl₄ in olive oil by intraperitoneal injection once a day for 6 days, and the last was a group that was administered only olive oil intraperitoneally.

After the intraperitoneal administration of ¹³³Xe saline solution (3 uCi), the rat was encased in animal chamber, then the differential radioactivity of respiratory ¹³³Xe was measured and recorded continuously.

The analysis of radiorespirometric pattern was determined with two parameters, peak time (PT) and peak height (PH) by method Matsuoka et al.

The respiratory ¹³³Xe of control immediately reached the maximum within one minute after start up of measurement and returned to background after 10 to 15 min. On the other hand, marked changes were observed between the control and experimental animals. In the both cases of the CCl₄ rats and the olive oil rats, PT was slightly delayed and also PH was lower than that of control, but olive oil rats proved rather quick recovery, while CCl₄ treated rats did not show recovery during with the above mentioned dose.

These results might indicate that the radiorespirometric method utilizing ¹³³Xe appears to be useful as the primary screening method for detection of fatty liver.