

minutes. On the other hand, on the cases of cirrhotic pattern, it showed a tendency to be delayed more than 9 minutes.

Comparing the value of  $T^{1/2}$  and the pattern of hepatoscintigram, the width of the liver on the hepatoscintigram became longer according to the delay of  $T^{1/2}$ , and the length of right lobe shorter, but the length of left lobe kept statical. In other words, so called cirrhotic pattern is more depending on the contraction of the length of right lobe than compensatoric hypertrophy of left lobe. On the relationship between  $T^{1/2}$  value and some biochemical hepatic examinations, serum AL-P and interus index are both independent with  $T^{1/2}$ , TTT is generally statical with  $T^{1/2}$ , and ZnST shows

some linear relationship with  $T^{1/2}$ .

Besides this, there is another liver function test using radioisotopes,  $^{131}\text{I}$  rosebengal test. 3 scintillation detectors are set on liver, gall bladder and intestine, to record the activity continuously. After 2 hours from the beginning of the test, fat meal are took by the patients to make the gall bladder contraction. By this examination the diseases of the ducts are also available, but it is difficult to separate the activity in each organ clearly. To check the changes of  $^{131}\text{I}$  rose bengal activity, some serial scintigram are valuable. For the purpose the scintigrams by scintillation camera are more convinient than conventional scanner.

### Diagnosis of the Infatile Janndice by $^{131}\text{I}$ -Rose Bengal Scanning

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The usual laboratory diagnostic manouver have repeatedly failed to differentiate between the congenital biliary atresia and the infantile hepatitis with obstructive jaundice.

Delay in surgical conection of biliary atresia aggravates the secondary biliary cirrhosis and decreases the chance of recovery. Surgical exploration carries a small but definite risk to patients with hepatitis. The liver biopsy may be misleading. The need for early recongnition of biliary obstruction of the newborn has been repeatedly stressed.

The  $^{131}\text{I}$ -Rose Bengal hepatic photoscan and

counting the radioactivity over the heart, liver and intestine, and rate of the accumulation in the liver can be verified to have a most advisable diagnostic value to attain a clear-cut diagnosis.

The scans have been analyzed for the following features:

- (1) Presence of isotope in the intestine
- (2) Indentification of the isotope in the kidneys

The  $^{131}\text{I}$ -Rose Bengal test is of most value in evaluating the jaundiced neonate.

### Considerations on $^{198}\text{Au}$ Colloid Hepatic Uptake Rates of Liver Tumors

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The purpose of this study is to evaluate the relationship between size and localization of tumors in the liver and hepatic uptake rate constant of  $^{198}\text{Au}$  colloid.(KL). Total cases are

26 which have been confirmed by surgery or autopsy and include primary and metastatic carcinoma of the liver. A scintillation probe with a NaI crystal ( $2''\phi \times 2''$ ) and a flat field

type of collimator which was placed over the liver was used for this study. Fifty microcuries of  $^{198}\text{Au}$  colloid were administered and measurement of hepatic uptake was recorded until the uptake curve has reached to plateau.

Total cases of primary hepatic tumors are 11. In 8 cases which have associated with cirrhosis, KL value might indicate hepatic blood flow of the cirrhosis.

On the other hand, in 3 cases without cirrhosis,  $^{198}\text{Au}$  colloid tests have shown indefinite value of WL, according to the grade of hilar invasion. Total cases of the hepatic metastases are 15.

In 13 cases which have not associated with cirrhosis, KL value ranges from 0.11 to 0.25 (Mean Value; 0.16), and is independent to

the size and the location of the metastatic tumors except in hilar region.

Two cases of hepatic metastases co-existing with cirrhosis were observed,, however, the reason for the fewer occurrence of metastatic carcinoma in the cirrhotic liver is obscure, the vascular change and fibrosis in the liver suggest to be important causal factors of the metastasis.

As correlation between KL and  $T_{1/2}$  is not linear but hyperbolic, changes of the values of KL are not so many as to the changes of the values of  $T_{1/2}$ . So, in case of severe circulatory impairment such as liver cirrhosis,  $T_{1/2}$  should be used for understanding of liver function.

### Experimental Examination on the Spleen Visualization in Scintiscanning of Liver Disease

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In liver scintiscanning by radioactive colloids spleen visualization as well as deformities of the liver is known to be a common finding in patients with cirrhosis of the liver. In our experience also, the spleen was visualized in almost all the patients with liver cirrhosis, but not so commonly in patients diagnosed as chronic hepatitis histologically by biopsies. In such uncommon cases with chronic hepatitis much decreased disappearance rate of radioactive colloids were observed as well as spleen visualization. This observation seems to suggest some relation between the spleen visualization and the degree of liver damage. Some experiments about the relation were made and the results were reported.

Using rats, chronic liver injuries were induced by  $\text{CCl}_4$  intoxication and by egg yolk sensitization according to Campbell's method. Tracer dose of  $^{198}\text{Au}$  colloids (0.5  $\mu\text{g}$  per 100g rat) were injected into the tail vein. Time specimens were drawn from the periorbital

capillary plexus and counted. Correction of the count was made by Hb determination of the specimens. Tissue distributions were determined by the use of animal counter. Normally disappearance rate constant was  $0.89 \pm 0.28 \text{ min}^{-1}$ , uptake of the liver was over 90% of injected dose and uptake of the spleen was  $1.0 \pm 0.4\%$ .

The results from  $\text{CCl}_4$  intoxicated rats were as follows. In rats with mild liver injury showing fatty degeneration and slight fibrosis, both disappearance rate and tissue distribution were in normal range. In rats with more enhanced liver injury showing marked fibrosis and lobular disorganization, much decrease of disappearance rate were found (0.45–0.69  $\text{min}^{-1}$ .) Uptake of the liver was decreased but increase of uptake of the spleen was not found.

In the rats with yolk egg sensitization during 50 days and with fibrosis and lobular disorganization of moderate degree disappearance