

Statistics of Liver-Scannings by Edge-Punched Cards

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From May 1962 to September 1967 were performed 2069 liver-scannings in our department and confirmation of the diagnosis was established in 613 instances. Objected diagnosis was established autopsy, laparoscopy, biopsy, laparotomy and follow up over one-year period on the basis of the clinical course and biochemical dates.

The originally designed edge-punched cards were prepared and very useful to review of many instances. In this series, there were 57 instances of normal liver, 49 instances of chronic hepatitis and 67 instances of cirrhosis. It was our purpose to measure the size of the scanning belonging to these three kinds.

The dimension of the liver were studied in 20% cut-off scintiscannings. In normal instances, right widths were ranging 10 to 15 cm. The majority of chronic hepatitis and

cirrhosis were within normal range, so there were not diagnostic value in right width alone. But it should be noted that the all instances under the 9 cm were cirrhosis. Left widths were ranging from 5 to 9 cm in normal liver. Chronic hepatitis and cirrhosis were almost scattered in normal range, so left widths alone were not valuable. But, in these cases, there were relative enlargement of the left width to the right one. Particularly, this tendency was proved in cirrhosis.

In liver-scanning, appearance of the spleen had great diagnostic value. Spleen was never visualized in the normal instances, not vice versa. The great part of chronic hepatitis ranged under the 6 cm length. Among those instances over the 7 cm, 82% of which were cirrhosis.

Hepatic Function Test by Means of Radioisotopes

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The blood flow rate of the liver is one of the indexes of the liver function, which is easily available from the decay curve of injected colloid in the circulating blood. Usually the half diminishing time ($T_{1/2}$) of the decay curve is applied, and it is calculated indirectly from the deposit curve of ^{198}Au radiocolloid to the liver from the following

formula: $S(t) = 1 - e^{-\lambda t}$

Where $s(t)$: relative activity from the liver at "t" Minutes after injection, λ : decay constant.

$T_{1/2}$ is available as $\ln 2 / \lambda$

This is the valuable test which is pursued simultaneously with hepatoscintigram. But it must be noticed that the analysis of this test shows many unknown factors, because the value of this test is easily differed by the condition of the subject, the drawing method of analyst, position of detector on the patients and so on.

Considering the errors from those factors, we analysed about 1000 case of $T_{1/2}$ with hepatoscintigram. Most of the normal pattern hepatoscintigram cases, showed $T_{1/2}$ within five

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}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}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}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}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}I -Rose Bengal test is of most value in evaluating the jaundiced neonate.

Considerations on ^{198}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}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