

A Experimental Study of Liver Scintiscanning

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Ability of detecting space occupying lesions on liver scan was experimentally investigated using three nuclides- ^{198}Au , ^{131}I , and $^{99\text{m}}\text{Tc}$.

Experimental materials and method:

- 1: Liver phantom was placed in a body phantom in prone position which is 20cm thick and filled with water.
- 2: Tumor models of 1.5 cm. to 5 cm. in diameter were placed in the right and left lobes of the liver phantom.
- 3: Instrument is Shimazu-Multiscintiscanner.
- 4: 300 μCi or 600 μCi of ^{198}Au and ^{131}I was poured into the liver Phantom and $^{99\text{m}}\text{Tc}$ was used in a dose of 3mCi. or 6mCi.
- 5: 5cm. and 10cm. focusing collimator were used.

Result:

- 1: Collimator

Satisfactory resolutions were obtained with 5 cm. focusing collimator using ^{198}Au and ^{131}I and with 10 cm. focusing collimator using $^{99\text{m}}\text{Tc}$.

- 2: Detectable diameter or tumor models

Tumor models more than 4 cm. in diameter located at the midportion of the right lobe were detectable in every nuclides and collimators. Tumor 3 cm. in diameter could be detected in some cases using both ^{198}Au and ^{131}I , but $^{99\text{m}}\text{Tc}$ always gave good visualisation. Tumor 2 cm. in diameter was visualized only with $^{99\text{m}}\text{Tc}$ under the good conditions of the scanner.

We obtained a excellent visualization of tumor models in the liver using $^{99\text{m}}\text{Tc}$. When tumor models were located both at the right and left lobes and conditions were set to the right lobe, no tumor in the left lobe could be detected because of low gamma energy in the left lobe.

Conclusion:

^{198}Au or ^{131}I are more suitable for routine studies of liver scintillation scanning and $^{99\text{m}}\text{Tc}$ should be used for further evaluation.

Hepatoscintigram on the Tumor of Biliary Tract

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Occasionally clinical diagnosis on the tumor of biliary system is very difficult. Especially the detection of the involvement of any portions of biliary tree is more difficult. The purpose of this study is the application of hepatoscintigram for detecting the tumor of the biliary tree. We reviewed 30 cases of the carcinoma of the biliary tree, which were confirmed operatively. The incidence of involvement of the biliary system is as follows; 4 of left intrahepatic biliary duct; 4 of right intrahepatic biliary duct; 7 of gallbladder; 5 of distal com-

mon bile duct; 10 of ampulla of Vater.

The tumor of biliary system are divided into 4 patterns, according to the scintigraphic changes in character as scanned hepatic form, the position of scanned defects and the dot density in the hepatoscintigram due to the uptake.

(1) central thin uptake type (2) central-defect type (3) right or left defect type (4) right lower edge defect type.

The correlations between the localization in various tumors of biliary system and these

scan patterns are studied.

In 6 out of 7 patients with gallbladder carcinoma, scintigrams are in the pattern of "the right lower edge defect type". In 6 out of ten cases of the ampullary carcinoma and the cancer involving the cystic or distal common bile duct, scintigrams are in the pattern of "the central thin uptake type". In the cases of intrahepatic biliary duct carcinoma, the scintigrams are in the pattern of "the central thin uptake type" or "the central defect type". Above all, in all the cases of left intrahepatic biliary duct carcinoma, these are in the pattern of "the left defect type".

Generally, in various cases of the tumor of biliary tract, the enlargement of the liver and the scan pattern of "the central thin uptake type" or "the central defect type" are shown.

In the cases of obstructive jaundice, there are stenosing lesions at the various level of

the biliary tract. Accordingly this accelerates the pressure back to the biliary tract. Enlargement of the liver and marked dilatation of the intrahepatic and common bile duct are resulted. Therefore, even if there is not any space occupying lesion in the liver, the scintigram display the scan pattern of "the central thin uptake type" due to marked dilatation of the biliary tract. Especially, at the left lobe of the liver, the effect due to marked dilatation of the intrahepatic bile duct is resulted very easily. In the cases with gallbladder carcinoma, scintigrams show the scan pattern of "the right lower edge defect type". This scan displays that the gallbladder carcinoma invades the surrounding liver bed area.

Hepatoscintigram is very useful for the detection of the tumor of biliary tract, especially for detecting stenosed part of the biliary tract due to the carcinoma.

Postoperative Observations of a Case Receiving Lobectomy of Total Right Liver Lobe for Embryonal Hepatoblastoma by Liver Scintigrams.

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The subject is 8-year old girl with abdominal tumor as her principal complaint. History of the family was uneventful. She was delivered normally and no malformation could be detected. Present history: While swimming in the sea (August 7, 1966) she complained a severe pain in the right hypochondrium with fever of 38° C. On the following day fever subsided, but general malaise and dyspnea at walk continued, and visiting a certain hospital she was suspected of hepatic tumor and admitted to Department of Pediatrics, Okayama University. As the result of exhaustive examinations including the scintigrams, she was diagnosed as having hepatoma and transferred to Department of Surgery. On admission here, she was rather small in stature, somewhat under-

nurished, her face rather pale, but no anemia in blepharoconjunctiva and jaundice in adnata. Aside from slight systolic murmurs of the cardiac apex, no other abnormalities were found in the heart and lung. The lung-heart demarcation showed a rise in the fourth intercostal region, the liver palpable 4 fingers' breadth from the costal margin, its surface somewhat irregular and rough but no tenderness. The spleen not palpable, no enlargement of area of dullness, no ascites or edema. The examinations on admission revealed hypochromic anemia, leucocytosis, rise in the serum cholesterole and alkaline-phosphatase.

Preoperative roentgenograms showed a marked upheaval of the right diaphragm, and the liver scintigram disclosed a large lesion