and radioiodinated rose bengal were used in differential diagnosis of hepato-biliary disorders. Christie et al. have commented on the disappearance rate of colloidal radiogold in liver cirrhosis. These authors have found that the disappearance tended to be abnormally delayed in liver cirrhosis. Recently, the present author has carried out a control study on this subject, and has been also to confirm the observation. According to Shaldon et al. extraction of colloidal particulates becomes reduced in liver cirrhosis due to the formation of intrahepatic arteriovenous shunts.

So it appears that the disappearance rate is an excellent index of the hepatic blood flow and of the effeciency of the hepatic extraction of colloidal particulates. Furthermore, changes in the hepatic blood flow and extraction have been shown to be rather specific of certain pathophysiologic conditions dy Murray et all.

Clinical Application of Scinticamera (3) Function Test of the Liver and Bile Duct

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Time sequence of the bile excretion was studied on 41 cases, including 22 with jaundice, by using ^{131}I-Rose Bengal.

In normal cases the average excretion time was 30 minutes to the gallbladder, 45 minutes is the bile duct and 60 minutes to the digestive tract.

The results obtained under pathological conditions were as follows:

1. Congenital choledochusatreasia (3 cases)

No sign of entry into the extra-hepatic duct was found. The appearance of renal shadow in the early stage was very important same as to Taplin, who reported this finding as pathognomonic.

We have experienced a case of leucaemic hepatic necrosis, in which early renal appearance was also prominent. The mechanisms of renal appearance should be subjected in the future study, in connection with the possibility of differential diagnosis of congenital bile duct atresia from childhood hepatitis.

High dependency between alkaline phosphatase in serum and RI excretion time was confirmed.

2. Cholelithiasis with jaundice

No cholecystogram was obtained, instead RI retention in the choledochus and excretion into the digestive tract was positive.

3. Metastatic liver disease

No pathology was found.

4. Choledocus dilatation (one case)

The finding was most striking and pathognomonic. The size of the cholecyst increased enormously with time reading maximum as 3 hours and continued same for a considerable period of time.

An Experimental Study on Detectability of Filling Defects in the Liver Phantom and the Effect of Respiratory Movement on it by using Seintillation Camera

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(Introduction)

We reported before the detectability of filling defect in the liver phantom containing ^{99m}Tc, ^{131}I, ^{198}Au by using a rectilinear scan-

ner .Additional factors affecting the visualization of the space-occupying defect in the liver are the size of the defect, the thickness of the liver in which the defect lies, the depth of the defect whithin the liver, the pertinent use of radioisotopes and the effect of the respiratory movement. Objections were to study the detectability of the filling defects in the liver phantom by using scintillation camera and the effect of the respiratory movement on it.

(Method)

Spherical plastic models were set in the center of the right and left lobe of the liver phantom as filling defects in our study. The thickness of the right lobe was 10 cm and that of the left lobe was 5 cm. The nuclides used here were ^{99m}Tc, ^{131}I ^{113m}In and ^{198}Au. The amount of radioisotope loaded into the phantom varies from minimum of 300 μCi of ^{198}Au and ^{131}I to 6 mCi of ^{99m}Tc. The spherical model of the defects were 5, 4, 3, 2 and 1.5 cm in diameter.

To evaluate the effect of the respiratory movement, the phantom was moved foreward and backwards on the rail in stead of the respiratory movement at the average speed of normal respiration.

(Results)

1. The minimal size of the defect which could be visualized with Anger Scintillation Cameara were 3 cm in the right lobe and 2 cm in the left lobe when the defects were set in the center of each lobe, whichever nuclides described above is used. However, when ^{99m}Tc was used the spherical defect would seem to be detectable even if the diameter was 2 cm in the right lobe and 1.5 cm in the left lobe.

2. Respiratory movement decrease the detectability of the spherical defect in liver phantom. When the respiratory movement was 2 cm in distance, 4 cm spherical defect could be visual in both right and left lobe.

3. When the phantom was loaded with 6 mCi of ^{99m}Tc optimal scintiphoto could be obtained in short time of 10 seconds without increase in brightness of the oscilloscope and the spherical defect measuring 3 cm in diameter could be visualized in the right lobe and 2 cm in left lobe.

(Summary)

Respiratory movement decrease the detectability of the filling defects in the liver but it is easy to stop breathing for ten seconds. ^{99m}Tc and ^{113m}In can be used at the higher unit of mCi without care of radiation dose.

Experimentally, good liver scintiphoto could be obtained without effect of respiratory movement in ten seconds, if 6 mCi of ^{99m}Tc or ^{113m}In is gathered in the liver. However, if this is applied clinically, there are some problems such as up-take ratio of radioisotope in the liver, increased radiation dose of examiner and troublesome procedure of making TcS colloid, etc.

Radioisotope Diagnosis of the Liver

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The radioisotope diagnosis of the liver using ^{198}Au colloid is performed by liver scanning and scintiphotography. These findings are compared with that of the selective hepatic arteriography from the point of view in detecting the liver tumor. The cases studied are primary liver cancer 13 (hepatoma 11, cholangioma 2), metastatic liver cancer 26 (gastric cancer 8, renal ancer 1, ureter cancer 1, colon cancer 4, papillary cancer 2, ovarian cancer 1, lung cancer 1), and control 11 (liver-cirrhosis 4, cholecystopathy 5, chronic pancrea-