titis 2).

The detection ability of liver cancer is classified into four grades: that is, not diagnosed (−), dagnosed (+), easily diagnosed (±), measurably diagnosed (卄). The detectability of each diagnostic methods is as follows: if that of hepatic arteriography is assumed to be 100%, liver scanning and liver scintiphotography are 61.5% and 90.4% respectively.

Application of Digital Computer into Clinical Evaluation of Liver Scan

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The digital computer processing was carried out for differential diagnosis of liver diseases. Two methods, matrix and discriminant function were used for this purpose. In this series, 9 data from liver scanning (right width, left width, length of spleen, number of defect, bone marrow visualization, mottled appearance, faint appearance, elevation of the right lobe, and elevation of both lobes) and 11 laboratory data (serum protein, A/G ratio, icterus index, serum bilirubin, ZTT, TTT, GOT, GPT, alkaline phosphatase, BSP and total cholesterol) were selected, and 150 proved cases were chosen for the study.

Matrix method is very close to the thinking way of physician's diagnosis. Making the matrix of diseases and informations with many logical IF circuits, probability of a disease was output in order after these matrix elements logically. This method is most useful in picking up a few diseases from a large number of diseases. In our study, this method gave a good result in the diseases such as acute hepatitis, hepatic tumor, Banti's Syndrome, but poor result in chronic hepatitis and cirrhosis.

The discriminant function, one of the multi-variate analysis, was used to determine the discriminant coefficients between two respective liver diseases. Using the linear function of the data multiplied by the coefficients, proper answer of the disease could be obtained in 80% of the case on the average. Liver scan includes the continuous and discrete type of data and these data are not suitable for discriminant function in a strict sense, but in practice discriminant function could fairly support to make a differential diagnosis. In the above mentioned procedure, scan data or/and laboratory data were utilized and the results by these ways were compared each other. Hepatom could be differentiated by liver scan data alone, but the other liver diseases could not be done always because of shortage of informations.

Classification of ^{198}Au Scintigram of the Normal Liver

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Methods and Materials

An Aloka JSS-103 Scientiscanner, Cristal 3 × 2 inch (NaI), Collimator 19 holes Focus 10 cm honey cone were employed in this study. A

scanning was started 30 minutes after intravenous administration of ^{198}Au (colloidal gold) in doses of 3.0 μCi per kilogram of body weight. Normal subjects in this study were 28 males and 22 females between the age of 20 and 70 who were operated with diagnosis of gastritis, peptic ulcer and gastric polyp. Normal range of scintigram was settled on the subjects who had no pathological findings of liver on liver function (including total serum protein, A/G ratio, icteric index, alkaline phosphatase, Z.T.T., T.T.T., SGOT, SGPT and B.S.P. test), gross anatomically and microscopic anatomically.

Variation in Normal ^{198}Au Liverscintigram

Normal configuration of ^{198}Au liverscientigram was classified into 5 types. A. Standard type, 56% of this series had the typical triangular configuration which were seen mostly in males of standard build. B. Left lobe hypertrophic type was 22% of all, and mainly short and fatty females belonged to this type. C. Right lobe hypertrophic type was encountered 8% of all in normal build. D. Left lobe atrophic type (8%) was seen mainly in short and thin females. E. Right lobe atrophic type (6%) was seen in short and thin males.

Conclusion

In this study the configuration of normal ^{198}Au liverscintigram was classified into 5 types and closely connection was demonstrated between sex and body build.

Differentiation of Hepatoma by the Use of ^{75}Se-Selenomethionine for the Liver Scintiscanning

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The detection of cancer in the liver by scintiscanning method depends on the cold uptake using radioactive colloid or ^{131}I-Rose Bengal. But this method helps us little to differentiate hepatoma from the metastatic cancer in the liver.

^{75}Se-Selenomethionine is usually used for pancreatic scanning. But this substance accumulate abundantly in the liver and high ^{75}Se activity is observed much longer than in the pancreas. If this affinity may remain also in the hepatic cells which have become malignant, it would be possible to differentiate hepatoma from the other space occupying lesion by comparison of liver scintigram with ^{75}Se-Selenomethinine and that with radioactive colloid or ^{131}I-Rose Bengal. Under this consideration we used ^{75}Se-Selenomethionine in four patients with hepatoma and several patients with metastatic cancer of stomach and with cholangioma. Among the four patients with hepatoma, three was associated with cirrhosis of the liver.

In all cases of hepatoma remarkable hot areas were observed in the liver scintigrams with ^{75}Se-Selenomethionine in contrast to the cold area with ^{198}Au colloid and ^{99m}Tc colloid. These sites were confirmed histologically as hepatoma by laparotomy and necropsy. In one cases hepatoma seemed to have more enhanced uptake than the non malignant liver cells. In another cases the central area had more poor activity suggesting central necrosis. On the contrary, in the cases of liver metastasis, sites of cold uptake of radioactive colloid were remained also to be cold by the use of ^{75}Se-Selenomethionine.

By the above results the use of ^{75}Se-Selenomethionine for liver scintiscanning is thought to be valuable for the diagnosis of hepatoma.