type of collimator which was placed over the liver was used for this study. Fifty microcuries of ^{198}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}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 $T\frac{1}{2}$ is not linear but hyperbolic, changes of the values of KL are not so many as to the changes of the values of $T\frac{1}{2}$. So, in case of severe circulatory impairment such as liver cirrhosis, $T\frac{1}{2}$ shouldd 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 CCl_4 intoxication and by egg yolk sensitization according to Campbel's method. Tracer dose of ^{198}Au colloids (0.5 ug 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 ± 0.28 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 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 ($0.45-0.69$ 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

rate was normal but slight decrease of hepatic uptake and slightly enlarged spleen and increased uptake of the spleen were observed. The sensitization over 100 days induced more enhanced liver injury such as marked fibrosis and lobular disorganization. In these rats disappearance rate was reduced (0.40—0.60 min^{-1}). The decreased hepatic uptake (80～84%) and slightly increased splenic uptake as well as slightly enlarged spleen were observed.

As indicated above, two groups of rats with liver injury gave different results in both splenic and hepatic uptake of radioactive colloid. However, decrease of the hepatic uptake was observed in rats with enhanced liver injury in both of the two groups. Therefore the above experiments seems to indicates that the decrease of radioactivity over the liver results in th relative increase of radioactivity over the spleen and cause spleen visualization more easily.

An Analysis of Hemodynamics of the Liver by Intrasplenic Injection of ^{198}Au Colloids Determination of Distribution Function of Transit Times and Intrahepatic Shunt

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The surface counting curve recorded over the liver after sudden injection of ^{198}Au colloids into the spleen, was analized to elucidate the hemodynamics of the liver. The curve usually shows rapid rise and fall, and a plateau, followed by gradual rise by recirculalation. The plateau indicates the removed amount of ^{198}Au colloids after passing through the liver as a borus, and in the initial phase of rapid rise and fall, we can suppose the accumulating process of colloids as well as colloids in the blood stream. Therefore the curve was considered to have the following three factors, removal rate per unit of time (ζ: sec^{-1}), distribution function of transit times h (τ), and imput function of colloids into the liver system from the spleen.

In our report the fraction of colloids removed in the liver after the one pasage was expressed as removal ratio or extraction ratio E to distinguish from the above removal rate constant ζ (sec^{-1}). We reported that the removal ratio E is related to the removal rate and the distribution function of transit times h (τ) by the equation $E=1-\int_0^\infty h(\tau)e^{-\zeta}d\tau$

As the removal of colloids in the liver should be considered to be in proportion with the amount of colloids in the blood in the liver, the removal rate constant ζ (sec^{-1}) is determined by the construction of accumulating process under the surface counting curve. The imput function of colloids may be estimated by the disappearance curve over the spleen, but this estimation is not exact.

The further analysis was made by application of Laplace transform to the relation between the imput function, the distribution function of transit times and observed surface counting curve over the liver and we demonstrated that the distribution function of transit times, the mean transit time and the extracction ratio by digital computer using the above approximately estimated imput function as initial guess.

The results in normal and in a case of liver cirrohsis were reported. In a normal case, the mean transit time was 11.55 sec and the distribution of transit times was resembled to Poisson distribution having a peak between 10 and 10.25 sec., and the extraction ratio was