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CLINICAL USEFULLNESS OF INTEGRATED IMAGE OF RADIONUCLIDE LIVER ANGIOGRAM(INTEGRATED IMAGE) TO EVALUATE DIFFUSE HEPATIC DISEASE.

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We propose new imaging method that is integrated image of radionuclide liver angiogram. Integrated image was recorded for 100sec following injection of 111-222MBq(3-6mCi) of Tc-99m tin colloid. We examined 595 cases, and classified thses cases into 3 groups as follows. Group I:Cases without hepatic dysfunction. Group II:Cases with hepatic dysfunction. Group III:Liver cirrhosis. Numbers of each group are 208(35%), 305(51%), and 82(14%) respectively. Integrated images were qualitatively determined by macroscopic inspection. Compairing liver intensity and lung intensity, 3 patterns of integrated image were classified. Pattern I:Liver intensity was greater than lung intensity. Pattern II:Liver intensity was equal to lung intensity. Pattern III:Liver intensity was less than lung intensity. Numbers of each pattern are 412(69%), 125 (21%), and 58(10%) respectively. Numbers of group III distributed into each pattern were 8(10%) in pattern I, 29(35%) in pattern II, and 45(55%) in pattern III. We consider that this new method seems usefull in evaluating diffuse hepatic disease.

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EVALUATION OF ANGIOTENSIN II PERFUSED ENHANCED RI ANGIOGRAPHY ON HEPATOCELLULAR CARCINOMA AFTER TRANSCATHETER ARTERIAL EMBOLIZATION THERAPY.

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Transcatheter arterial embolization(TAE) therapy for hepatocellular carcinoma(HCC) has developed recently, but using TAE therapy only once is not sufficient. Therefore, it is important to repeat TAE when the blood flow of HCC is re-established. However, it is very difficult to know exactly when it dose. Tc-99m Red Blood Cell imaging(RBC imaging) is the only imaging modality available to estimate the vascularity of the tumor noninvasively. Moreover, we paid attention to the unique merit of Angiotensin II(AT-II) which decreases the blood flow of normal liver tissue and increases the blood flow of the tumor. Eight patients with HCC on whom TAE was not performed were evaluated to estimate the enhancement effect of AT-II. Then 28 enhanced RBC imaging obtained from 10 patients with HCC, on whom TAE was repeatedly performed, were evaluated. The enhancement effect ratio with AT-II ranged from 1.34 to 14.5(mean 3.65). The accuracy of enhanced RBC imaging in estimating the vascularity of the HCC after TAE was 86%(24 out of 28). AT-II perfused enhanced RBC imaging is very useful for diagnosing the recurrence of HCC after TAE, and, as a result, we can be sure when to perform TAE again.

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INTRAHEPATIC DYNAMICS WITH Tl-201 PORTAL ADMINISTRATION IN RATS (THE 3rd. REPORT)

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We have reported on a new approach for clinical evaluation of porto-systemic circulation with Tl-201 chloride. The heart to liver ratio(H/L) increases in patients with severe liver injury. The purpose of this study is to evaluate the factors which influences this phenomenon.

Intrahepatic dynamics of Tl-201 Cl were studied using normal rats and those with acute liver damages induced by 20% of CCl_4 in olive oil. Tl-201(0.5μCi) was directly injected into the portal vein which was exposed. Serial scintigraphic images were obtained, and the time-activity curves were generated in the regions of interest over the liver. Biodistribution of the Tl-201 Cl was also investigated. The rats were sacrificed 2 min. after injection. The liver was taken and homogenized for measurement of the weight and the radioactivity.

The following results were obtained.

1. Tl-201 Cl uptake of the normal liver was 68% 2 min. after intraportal administration. The radioactivity in the liver decreased monoexponentially as a function of time, and its physiological half life was about 43 min.
2. In the models of acute liver injury the Tl-201 uptake in the liver significantly decreased to 52% ($p<0.005$).

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DEVELOPMENT AND CLINICAL APPLICATION OF Tc-99m-PMT FUNCTIONAL IMAGE FOR LIVER DISEASES.

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Using a nonlinear regression analysis for Tc-99m-PMT dynamic curves over the liver, we have developed the functional image which demonstrates regional hepatic uptake and excretion functions topographically. During the 60 min after injection of Tc-99m-PMT, 60 sequential images were obtained by a gamma camera with a computer system. After setting the hepatic region, Tc-99m-PMT dynamic curves over the liver were extracted from the serial images every each element (64 x 64 matrices). According to the following formura, these curves were analyzed by a nonlinear regression method and hepatic uptake rate (Ku) and excretion rate (Ke) were obtained. $C(ti)=Co(e^{-Keti}-e^{-Kuti})$

C:count rate, Co:C of time 0, Ke:excretion rate, Ku:uptake rate.

The values of Ku and Ke were displayed as color images in 64 color steps. Functional image clearly demonstrated the intrahepatic distribution of hepatic uptake and excretion functions. In chronic liver diseases, Ku and Ke were decreased. In hepatocellular carcinoma, Ku was not different between tumor and non-tumor regions. On the other hand, Ke was markedly decreased in tumor region.