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CLINICAL EVALUATION OF PORTAL SYSTEMIC CIRCULATION BY Tl-201 PER-RECTAL ADMINISTRATION --OBSERVATION OF THERAPEUTICAL EFFECT--

N. Tonami, K. Nakajima, H. Seki, K. Yokoyama, J. Taki, H. Ishida, T. Takayama, M. Seto, K. Koizumi, T. Aburano, K. Hisada, O. Sui*, Y. Hinoue, Y. Kato, K. Kobayashi, Y. Takase**. School of Medicine, Kanazawa University, Tokushima University*, Tsukuba University**.

We have reported a new method for evaluating portal systemic circulation by Tl-201 per-rectal administration and indicated that the heart/liver uptake ratio at 20 - 60 min. after administration (H/L ratio) is quite useful as the index of estimating the degrees of portal-to-systemic shunt. This method was employed to evaluate the change of portal-to-systemic shunt by sclerosing therapy of esophageal varices in 9 patients (11 times). The results were as follows.

1) H/L ratio (H/L) was changed after sclerotherapy of the esophageal varices.
2) The mean value of H/L was reduced in cases of effective sclerotherapy, but there were cases showing no change or little change in H/L.
3) This method revealed that portal-to-systemic shunting greatly depends on esophageal varices in cases showing reduced H/L after therapy and does not much depend on esophageal varices in cases showing no or little change in H/L.

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EVALUATION OF PORTAL CIRCULATION BY PERRECTAL PORTAL SCINTIGRAPTY AND RADIONUCLIDE ANGIOGRAPHY.

S.Shiomi,T.Minowa,T.Kuroki, T.Monna and S.Yamamoto. The 3rd Department of Internal Medicine, Osaka City University Medical School. Y.Shimonishi,M.Omura, H.Ochi and Y.Onoyama. Department of Radiology, Osaka City University Medical School. Osaka.

After bolus injection of 10mCi of Tc-99m phytate, scintigrams were taken sequentally up to 1 minite. Time activity curve were generated over the right lobe of the liver, the lung and the kidney. The Portal Component was measured in 115 cases acoording to modifed Sarper's method. On the other hand, using the technique of Per-rectal portal scintigraphy, measurement of Shunt Index was carred in 173 cases(the technique was reported previously).

Results were as follows;1)Portal componentes were 69.8±3.2% in normal(n=15),60.6±5.8% in chronic hepatitis(n=25),48.6±17.6% in hepatic cirrhosis without varices(n=31),28.7±12.2% in hepatic cirrhosis with varices(n=44). 2)Per-rectal portal shunt indices were 3.8±1.0% in normal(n=5),6.0±2.2% in chronic inactive hepatitis(n=26),7.9±3.6% in chronic active hepatitis(n=30),21.8±23.4% in hepatic cirrhosis without varices(n=46),69.7±18.4% in hepatic cirrhosis with varices(n=66). 3) Both Per-rectal portal scintigraphy and radionuclide angiography were performed in 37 cases. A good correlation(r=-0.83) was obtained between Shunt indices and Portal components.

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CLINICAL SIGNIFICANCE OF THE VISUALIZATION OF COLLATERAL VEIN BY PORTAL SCINTIGRAPHY IN LIVER CIRRHOSIS.

M.Kudo,M.Hirasa, Y.Ibuki,K.Fujimi,S.Ueda,S.Tomita,H.Komori, A.Todo,Y.Kitaura,H.Tochio,Y.Saiki, H.Yamaguchi,H.Ito and K.Ikekubo. Kobe General Hospital. Kobe.

Portal scintigraphy (P.S.) was performed on 46 patients with liver cirrhosis by a previously reported method. The collateral vein ("Cobra head sign") was observed in 18 patients (39%), four of whom had no esophageal varices revealed by X-ray and endoscopic examination. This sign was visualized in 9/12 (75%) of the patients with a prior history of hepatic encephalopathy, but in only 9/34 (26%) of the patients without this history. There was no significant correlation between heart to liver uptake ratio and the occurrence of hepatic encephalopathy. The present study indicates that the presence of "Cobra head sign" was significantly associated with hepatic encephalopathy. P.S. was found to be useful in the management of patients with liver cirrhosis.

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QUANTITATIVE ANALYSIS DIGITAL COMPUTER OF Tc-99m PMT HEPATOGRAM IN DIFFUSE PARENCHYMAL LIVER DISEASES.

K.Nabeshima, I.Narabayashi,M.Matsuo,K.Sugimura,N.Ishido, T.Hamada,S.Kimura and A.Kajita. Kobe University School of Medicine and The Center for Adult Diseases. Kobe and Osaka.

Tc-99m PMT hepatograms were analysed to provide information about liver and gallbladder. Calculations were based on a 4-compartmental model (heart, extra-vascular space, liver parenchyma, and intrahepatic bile ducts) and included corrections for blood, tissue and bile backgrounds. The time-activity curves for Tc-99m PMT in the cardiac region were described as the sum of 2 exponential functions, while curves for the hepatic region were described as the sum of 3 exponential components. The measured hepatograms were compared with simulated hepatograms and good agreement between the two curves showed that the compartment model adequately described the blood and bile activities in vivo.

The rate constants obtained from the kinetic model correlated well with the results of conventional liver function tests. The cases of chronic hepatitis and liver cirrhosis, there were lower rate constants for the excretion from the liver to the bile ducts than in normals and the relative distribution volumes also larger than normal. Due to its sensitivity, this technique proved very useful for determining hepatobiliary functions.