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A NEW METHOD OF PER-RECTAL PORTAL SCINTIGRAM BY DIRECT INTRAMURAL ADMINISTRATION USING $^{99m}TcO_4^-$

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For evaluation of portal circulation, we performed a new method of per-rectal portal scintigram by direct intramural administration using $^{99m}TcO_4^-$ in 24 patients with various liver diseases (acute hepatitis: 2cases, chronic hepatitis: 5cases, liver cirrosis: 17cases.). 30 minutes before intramural injection, patients received intravenous injection of stannous pyrophosphate (Sn-PYP) for in vivo labelling of red blood cells with Tc-99m.

In our method, portal vein, liver, heart, spleen and colateral vein of portal system were visualized more cleary than previous enema methods.

And it was easily suspectable of first systemic circulation state and recirculation state from time-activity curve which obtained from our new method, because tracer absorbed intravenous more rapidly than enema methods.

In conculsion, a new method of per-rectal portal scintigram by direct intramural administration using $^{99m}TcO_4^-$ seems to have more availability for evaluation of portal circulation than enema methods.

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COMPARATIVE STUDY OF PERRECTAL Tc-99m-O4 AND Tl-201-Cl PORTAL DYNAMICS BY SIMULTANEOUS SCINTIGRAPHY.

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After infusion of a mixture of Tc-99m-O4 and Tl-201-Cl, 1:1 in mCi, simultaneous dynamic scintigraphy was performed in every 15 seconds for 60 minutes to examine advantage and disadvantage of these tracers' dynamics. The contamination ratio of Tc-99m and Tl-201 in another γ-levels with 30 and 20 % window was 0.18 and 0.10 respectively on preliminary phantom experiment, the ratios which were used for subtraction of the contamination. Sixteen cases were selected as controls and other 12 cases, as shunted ones, in which extra- and/or intra-hepatic shunted flows were denied or detected definitely by portography by transhepatic or arterial rout, scintiphoto-splenoportography and/or endoscopy.

Absorption of Tc-99mO4 was rapid demonstrating portal trunk and collaterals, while that of Tl-201 Cl retarded with poor visualization of vascular rout but with more definite image of its initial distribution. The ROI-radiograms were obtained of the whole liver and whole heart for right, usual, and left, portopulmonary shunting as well as miocardial accumulation. The heart/liver ratio the initial steep and straight increment slope and that of the area in the same period of faster steep straight phase of these radiograms were culculated for both tracers. The area ratio of Tc-99m was most effective in discriminating 12 shunt cases from non-shunt range which distribution of 16 control cases developed.

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EVALUATION OF PORTAL-SYSTEMIC SHUNTING BY NUCLEAR MEDICINE.

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A new method of oral administration of thallium-201 enclosed in an enteric coated capsule was developed to evaluate the portal circulation through superior mesenteric vein. The results were compared to those with Tl-201 per-rectal study. It is speculated that most of superior mesenteric vein blood can flow into the liver, not much passing through the pathological shunts such as esophageal varices. We expect that the oral method can be useful for evaluating the pathophysiologic conditions in various hepatic diseases by using it with per-rectal administration, rather than the differential diagnosis. Although the per-rectal method can not view the whole portal circulation, it seems to be a sensitive method for reflecting the degrees of overall pathological portal-systemic shunting and the condition of portal hypertension.

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CORRELATION BETWEEN Tl-201 PER-RECTAL SCINTIGRAPHY AND HEMODYNAMICS IN PATIENTS WITH CHRONIC LIVER DISEASE.

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Although per-rectal scintigraphy has been considered as an useful method to evaluate portal-systemic shunt in liver cirrhosis, few studies have been done to compare between data obtained by per-rectal scintigraphy and hemodynamics. In 9 patients with chronic hepatitis and 21 patients with cirrhosis were measured the following parameters: heart/liver uptake ratio(H/L) at 20 min after Tl-201 per-rectal administration, wedged hepatic venous pressure, estimated and effective hepatic blood flow, cardiac index, azygos blood flow and the size of esophageal varices. H/L in patients with cirrhosis was significantly higher than that in patients with chronic hepatitis. H/L directly related to azygos blood flow and cardiac index in all patients. In cirrhotic patients, there were no significant relationship between H/L and other parameters. H/L in patients with varices was not different in patients without varices. It is suggested that H/L is little value to evaluate superior port-systemic shunt in patients with cirrhosis.