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RADIONUCLIDES STUDY ON THE SYNCHRONIZATION OF THE BILIARY AND GASTRO ENTERIC TRACT - FOCUS ON THE METHODOLOGY-. Y.Niio, Y.Kuniyasu, M.Kawakubo, S.Higashi, K.Nakaoji, H.Kakehi, T.Takada, H.Yasuda, K.Uchiyama. Teikyo University Hospital, Tokyo.

The digestion in the upper digestive tract is greatly effected with the function of gastro enteric and biliary tract. The purpose of this study is to observe the synchronization of gastric emptying and biliary excretion using dual tracer technique. We use In-111-DTPA as a scanning agent in the radiolabeled physiologic meals. In-111-DTPA fulfills the criteria of an ideal agent for gastric emptying measurements since it is neither absorbed nor adsorbed by the gastric mucosa. Also, we simultaneously inject Tc-99m-PMT as a cholescintigraphic agent, with orally administered In-111-DTPA. The emission from each radionuclide is displayed in color display system which we have developed. Thus we can visualize and analyse the function of biliary tract and gastro enteric canal and synchronization of them, on the same images. This test is being employed with increasing frequency in the evaluation of patients with disorders such as, post gastorostomy gastroparesis, vagotomy, dumping syndrome and in the study of normal gastric physiology in volunteers. This study suggests that dual radionuclide studies afford the greatest information regarding synchronization of gastric emptying patterns and biliary excretion to physiologic meal.

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RADIONUCLIDES STUDY ON THE SYNCHRONIZATION OF THE BILIARY AND GASTRO ENTERIC TRACT - CLINICAL STUDY ON THE CASE OF BILIARY AND PANCREATIC SURGICAL OPERATION - K.Uchiyama, T.Takada, H.Yasuda, M.Shishikura, J.Shikata, Y.Kuniyasu, Y.Niio, M.Kawakubo. Teikyo University Hospital, Tokyo.

The purpose of this study is to observe the synchronization of gastric emptying and biliary excretion. We use In-111-DTPA as a gastroscintigraphic and Tc-99m-PMT as a cholescintigraphic agent. In this study, there are 6 cases of cholecystectomy as control, 20 cases of biliary reconstruction and 10 cases of pancreaticoduodenectomy. Biliary reconstructed cases divide into papilloplastied cases, end-to-end choledochostomized cases, choledochoduodenostomized cases, choledochojejunoduodenoplastied cases and Roux-Y choledochojejunostomized cases. The types of digestive tract reconstructions of pancreaticoduodenectomy are divided into Cattel' and Child' methods. Results are as follows; 1) In the cases of Roux-Y choledochojejunostomy, it takes longer time to synchronize than in the other biliary reconstructed group. 2) In the cases of Cattel' type pancreaticoduodenectomy, it takes shorter time to synchronize than in the cases of Child' type. In conclusion this study is useful method to evaluate postoperative biliary and digestive function.

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EVALUATION OF HEPATOBILIARY SCINTIGRAPHY USING Tc-99m-PMT. H.Takenaka, Y.Hirono, K.Kosasa, I.Kamigaki, A.Shinotsuka, H.Munehika and T.Hishida. Department of Radiology, School of Medicine, Showa University, Tokyo.

In hepatobiliary scintigraphy, the findings of dilatation and/or RI stasis of intrahepatic bile duct (IHBD) and common bile duct (CBD) are sometimes seen. But these findings are not always accordant with the findings of other examinations, such as CT, ultrasound and ERCP. Thus, we classified about 40 cases with these findings into some groups according to the combination of the presence of dilatation and/or RI stasis of IHBD and/or CBD, respectively. And we studied the comparison between each group and findings of other examinations.

Following injection of 5 mCi of Tc-99m-PMT, serial images of the liver were taken during one hour with a large-field-of-view scintillation camera (Toshiba GCA-401). And the images were simultaneously collected into a computer system (Toshiba GMS-80A). The hepatogram analysis was performed and the liver excrete rate (Ke) of the right lobe was calculated. In the cases with dilatation and/or RI stasis of the left IHBD, the Ke of the left lobe was also calculated. Each group was compared with the presence of dilatation of IHBD and/or CBD demonstrated with other examinations and was compared with Ke and serum liver function tests.

The results were as follows. Many of the cases with RI stasis of the left IHBD without dilatation and having bi-symmetrical values of Ke had no abnormality demonstrated with other examinations. Also, many of the cases with RI stasis of CBD without dilatation had liver dysfunction and no dilatation of CBD revealed with other examinations.

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EVALUATION OF HEPATIC FUNCTION BY COMPUTER ANALYSIS OF Tc-99m PYRIDOXYL-5-METHYL-TRIPTOPHAN DYNAMIC CURVES. T.Kashiwagi, K.Takashi, M.Azuma, H.Matsuda, H.Yoshioka, H.Ishizu, N.Mitsutani, T.Koizumi and K.Kimura. Osaka Kosei-Nenkin Hospital and Osaka University Hospital. Osaka

We have developed a new analytical method for Tc-99m pyridoxyl-5-methyltryptophan (Tc-99m PMT) dynamic curves in the liver and heart using computer.

Fifty patients with liver diseases were studied. The curves were obtained from sequential images (time increment: 20 sec, total time: 60 min) of scintillation camera equipped with computer system. The theoretical models for curves were assumed as follows.

Hepatic uptake-excretion curve:

$$C(t) = C_0 (e^{-Kt_1} - e^{-Kt_2})$$

Cardiac disappearance curve:

$$C(t) = C_1 e^{-Kt_1} + C_2 e^{-Kt_2}$$

C: count rate,  $C_0$ : C of time 0,  $C_1$ : C of time 0 for  $Kd$ ,  $C_2$ : C of time 0 for  $K_2$ , Ke: excretion rate,  $Ku$ : uptake rate,  $Kd$ : disappearance rate,  $K_2$ : disappearance rate for second phase.

The measured curves were analyzed by non-linear regression method using above formulas and a good fit was obtained.

Values of  $Ku$ ,  $Ke$  and  $Kd$  were significantly decreased in patients with liver diseases as compared with patients without liver diseases. Therefore it is considered that computer analysis of Tc-99m PMT curves is clinically useful for evaluation of hepatic function in liver diseases.