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THE ANALYSIS OF Tc-99m RBC TIME ACTIVITY CURVE ON LIVER TUMOR.

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The purpose of this study is to differentiate hepatoma from hemangioma, in which similar image patterns on several diagnostic modalities are shown.
The cases examined are 16 cases of hepatoma and 16 cases of hemangioma.
Dynamic study was performed with using Tc-99m RBC as follows.Data store with first flow images with every 500 msec and late pool image with every 10 second during ca 20 min.Region of interest was settled on the tumor and its time activity curve was demonstrated.linear simulation with the method of least sqare was performed.Subtraction procedure was performed between these simulated lines of liver tumor and normal liver tissue.3 patterns of simulated lines are classified as down slope,horizontal and upslope. In hemangioma typical perfusion /blood pool mismatch were identified in 13 cases out of 16 cases.the line pattern was 8 upslope and 8 horizontal.
In hepatoma typical positive flow image and negative pool image were recognized in 6 cases out of 16 cases. The line pattern was 12 down slope and 4 horizontal.
With using this new analysis, differentiation between these horizontal lines would be possible.

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STUDY INTO THE CLINICAL USEFULNESS OF COMBINED LIVER SPECT AND GALLBLADDER SPECT.

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There have been several cases where discrimination between anatomical liver defects and SOL during liver SPECT image analysis proved difficult. Among these are cases of difficult diagnosis due to large individual differences in defects resulting from the gallbladder fossa. In this study, we accumulated data by ROTA CAMERA with the objective of determining the position of the gallbladder fossa in the liver SPECT image. Tc-99m-phytate, 10mCi was administered under conditions of 5°, 36 step, 72 view and 15sec/step to collect liver SPECT data. Immediately following this, Tc-99m-HIDA, 1mCi was also adminsitered. After 30-50 min, gallbladder SPECT data was collected at a speed of 7sec/step in 80 cases. Data processing was by SCINTIPAC 2400 using multiple integration. Processing was performed by Sorenson formula with absorption compensation set at $\mu = 1$, using a Butterworth image processing filter. A comparison was made between transverse, coronal and sagittal SPECT images in similar liver and gallbladder sections. Among the 80 cases, 16 were not delineated and 56 were images of the common bile duct. Combination of gallbladder SPECT with liver SPECT analysis was found to be useful in improving SOL diagnostic performance.

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SPECT VOLUMETRY OF LIVER AND SPLEEN. - REFERRING TO OPTIMAL CUTOFF LEVEL STANDARDIZED BY CT-ASSISTED VOLUMETRIC VALUES -

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To standardize SPECT volumetry, comparative studies on the accuracy of SPECT with CT were performed with a phantom as well as in clinical cases. The equipments used were MaxiCamera 400T with Star (Data Aquisition and Analysis System, GE) for nuclide study, and CT/T 9000 (YEW) or SOMATOM DRH (SIEMENS) for CT scans. This presentation dealt with determining the optimal cutoff level and analysing some deteriorating factors caused by respiratory movements during examination. Phantom studies, using a liver model (1510 ml) with 3 mCi of Tc-99m sodium pertechnetates, revealed that the cutoff level determination was greatly influenced by the organ-background ratios while SPECT volumetry upon artificially reciprocated movements showed good reproducibility only 2-3% less than the absolute volume of the inmobilized phantom. In 24 patients who underwent SPECT followed by CT, hepato-spleno-volumetry was performed independently. Used radionuclides were 3 mCi of Tc-99m Sn-colloid. According to these comparative volumetries, SPECT measured 12% larger on the average than CT. Although the CT-assisted volumetry is believed to be reliable, some problems are still remained such as to keep breath-holding uniform at each scanning. Further refinement in SPECT volumetric techniques may include an establishment of algorithm for the optimal correction formula.

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ESTIMATION OF THE LIVER & SPLEEN VOLUME AND UPTAKE RATIO BY SPECT: -FURTHER REPORT-.

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We have reported the clinical usefulness of estimation of the liver volume and liver uptake ratio as an index of liver function. On this time,the spleen volume and its uptake were estimated.Relationship between these parameters and other liver function tests was also studied. Eighty one patients including 18 normal controls, 16 liver cirrhosis 37 various liver disease,were studied. SPECT images were obtained by MaxiCamera400T.Cutoff levels and relationship between count and activity(mCi) were obtained from phantom studies.In 16 cases,the liver and spleen volume were also measured with CT.
(RESULT) 1)Correlation between liver & spleen volumes estimated by CT and SPECT was good(r=0.92 & r=0.96) 2)Significant difference between volumes of normal and liver cirrhosis is observed. 3)Correlation between spleen volume and uptake is recognized in subjects without LC. In liver cirrhosis spleen uptake is higher than others in comparison with volume. 4)Negative correlation is observed between liver volume & uptake and ICG(R15). Slight correlation between liver volume and ChE is observed.
Estimation of volume and uptake of the liver and spleen is a useful procedure to assess liver function,mainly related with effective hepatic blood flow in liver cirrhosis.