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AUTOMATIC MEASUREMENT OF LIVER RADIOISOTOPE IMAGES---EXTRACTION OF CHARACTERISTICS AND ITS PATTERNS.

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Abnormal contour or space occupying lesion of radioisotope liver images was studied in order to extract characteristics for pattern recognition.
(1)Liver image contours were obtained with slicing on double threshold levels of radioisotope intensity distribution.
(2)The contours were divided into 180 parts every 2 degree by radii from a point near to the center in image to the contour.
(3)Each length of perpendicular to the string between two average coordinates of 1-20 points coordinates on both sides of a concerned point was written on the radii forming vector-like star pattern.
(4)Several level contours were checked. Theoreticalchecks to these treatments were studied and correlations between a series of perpendiculsr mutually and/or pattern of length and angular distribution of perpendiculars were checked.

These vector-like perpendicular patterns showed characteristics of contours;smooth contoursshowed shorts perpendiculars;edges of liver images showed longer ones. Averaging of a few points contained noises, and averaging of less than twenty points lost small defects.Typical pattern was three star one.Defect contour or abnormal contour showed many stars in proportion to it.

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Tc-99m-IDA SCINTIGRAPHY AND ULTRASONOGRAPHY IN EVALUATION OF BILIARY DISEASE.

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The comparative study of Tc-99m IDA scintigraphy and ultrasound was undertaken to evaluate the diagnostic efficacy in biliary disease, particularly cholestasis and gall bladder disease.

In 85 patients with cholestasis, the diagnostic accuracy of ultrasound (95%) was much better than that of Tc-99m IDA study (86%). If the dilated bile ducts were detected by ultrasound, the diagnosis of extrahepatic obstruction would be decisive. However, if ultrasound showed no evidence of obstruction, Tc-99m IDA study could separate patients with totally obstructed biliary flow, who required additional testing to define the correct therapy, from those with patent biliary flow for whom medical management was indicated initially.

In 22 out of 27 patients with gall bladder disease, Tc-99m IDA study could show no gall bladder activities, which was highly suspicious of gall bladder disease. On the other hand, ultrasound could reveal some gall bladder abnormalities, such as swelling , wall thickness, stone and/or tumor in 21 patients.

Thus, the complementary use of these two imaging modalities could provide more useful informations than each modality alone.

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COMPARATIVE STUDIES BETWEEN CT SCANS AND RN SCANS IN LIVER DISEASES.

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The total number of upper abdominal CT scans performed from Jan. 1978 to Sep. 1979 was 255 cases, with 193 cases(75.7%) studied also by RN scans. The both scans within 1 month interval were performed 120 cases (47.1%), whereas CT scans with liver scans were 112 cases(43.9%). RN scans usually preceded by CT scans at the rate of 76.7%. The population was cholelithiasis(16), gastric cancer(12), liver cirrhosis(9), hepatoma, gallbladder ca., colon ca.(each 6) and so on. After careful comparison, we concluded that CT scans were superior in the diagnosis of cystic lesions, intrahepatic bile ducts dilatation and in the detection of equivocal regions as porta hepatis, gallbladder fossa or thinning of the left lobe. The advantages of RN scans were capability of performing dynamic studies by hepatobiliary scans, combined approaches such as RN angiography plus Ga scan, and detection of hepatocellular diseases. The disadvantages of CT scans and RN scans were producing various artifacts, limited resolution respectively. In conclusion, the relationship between CT scans and RN scans was still not competitive but complementary.

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AN APPROACH TO THE DIAGNOSIS OF DIFFUSE HEPATIC DISEASE BY LIVER SCINTIGRAPHY AND CT.

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It has already been established that liver scintigraphy is useful in the diagnosis of diffuse hepatic disease. In this paper, the authors propose to investigate whether a convination of liver scintigrams and CT images is useful in the diagnosis of diffuse hepatic disease. Various indices relating the dimension of the liver and the spleen such as length,width and estimated volume were retained on CT images of patients with diffuse hepatic disease. A comparison of these indices and indices obtained on liver scintigrams showed excellent correlation and proved very useful in the diagnosis of diffuse hepatic disease.