272

CLINICAL EVALUATION OF SINGLE-PHOTON EMISSION COMPUTED TOMOGRAPHY ON SCREENING OF SMALL HEPATOCELLULAR CARCINOMA.

M.Kudo,Y.Ibuki,K.Fujimi,S.Tomita,H.Komori,Y.Okimoto,A.Todo,Y.Kitaura,Y.Saiki,H.Ito,Y.Morimoto and K.Ikekubo. Kobe General Hospital, Kobe.

This investigation was undertaken to evaluate the clinical usefulness of single-photon emission computed tomography(SPECT) using a GE Maxi Camera 400T with Tc-99m phytate on screening of small hepatocellular carcinoma(HCC), defined as solitary tumors less than 5 cm in diameter.

SPECT was performed in 342 patients with chronic liver diseases(187 liver cirrhosis and 155 chronic hepatitis) following conventional liver scanning. Ultrasound(US) and AFP assay were performed on all cases, too. The detectability of small HCC with these 4 modalities was compared.

The results were as follows:(A) We could diagnose 15 small HCC in 342 patients.(B) We could detect 4/15(27%) by AFP, 8/15(53%) by conventional liver scanning, 11/15(73%) by US and 12/15(80%) by SPECT. (C)Three of 4 lesions that could not be detected by US were located in the subdiaphragmatic region of the right lobe, where lesions are often overlooked by US. These 3 lesions were correctly detected by SPECT. (D)The 3 lesions that could not be detected by SPECT were correctly detected by US. (E)All 15 lesions were detected by the combination of SPECT and US.

In conclusion, the combination of SPECT and US is very useful as a screening procedure for small HCC.

273

TRIAL OF SEGMENTAL ASSESSMENT ON THE SPECT IMAGES OF THE LIVER.

H.Oyamada,S.Terui,H.Kawai and H.Fukukita. National Cancer Center Hospital. Tokyo.

In our procedure, liver scintigraphy is taken from 6 directions; anterior, posterior, right lateral, left lateral, right anterior oblique and left anterior oblique. When defects are observed, we usually try to point them on the basis of segmental anatomy of the liver. Taking the opportunity of installation of a scintillation camera (LFOV-E) which is designed for single photon emission computed tomography (SPECT) we extended segmental assessment of the liver to the SPECT images also, which were reconstructed for 3 plains as a routine; transaxial, sagittal and coronal.

Our conlusions are as follows:

1) Multi-directional scintigraphy (anterior, posterior, right lateral, left lateral, right anterior oblique and left anterior oblique) is essential for segmental assessment of the liver, which can give us fairly precise information about the segmental anatomy.

2) SPECT images give us further information especially when the lesions are deep-seated.

3) Transaxial SPECT images are useful for differentiating 4 major segments (left lateral, left medial, right anterior and right posterior), and sagittal and coronal images are useful for differentiating the subsegments (superior and inferior).

274

ASSESSMENT OF SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY FOR DETECTING SPACE OCCUPYING LESIONS IN THE LIVER—— COMPARISON BETWEEN THE 180 COLLECTION METHOD AND THE FULL 360 COLLECTION METHOD.

J.SATO, S.KOSUDA,A.ISHIBASHI,M.NAKAMURA,Y.TAKAHARA,Y.YONAHARA. Division of Nuclear Medicine, The 2nd Tokyo National Hospital. Tokyo.

Single photon emission computed tomography(SPECT) using a 180 gamma camera rotation mode was performed, and was comparatively evaluated with a full 360 rotation mode on 7 patients with space occupying lesions in the liver.

SPECT images were taken with the Hitachi scintilation camera,GAMMA VIEW-T, interfaced with the HITAC E-600/3 computer system. The gamma camera rotated from the right lateral to the left lateral position of the patient to collect 32 views, 20 seconds each, over a 180 angle. Total acquisition time 11 minutes in the 180 scan, while it was 22 minutes in the routine 360 scan.

In the liver phantom study, the smallest lesion found by the 180 scan was 1.5cm in diameter. In the clinical study, the 180 scan, without an apparent image distortion, was able to detect all of the lesions as well as the 360 scan. However, in deeper or posterior lesions, the former method provided worse lesion contrast with the ghost shadow.

In conclusion, the 180 collection method has some problems. In order to use it practically, improvement of the collection methods of image data is necessary.

275

CLINICAL APPLICATION OF SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY (SPECT) IN DIFFUSE LIVER DISEASES.

T.Kodama,K.Watanabe,H.Hoshi,S.Jinnouchi,K.Arakawa and H.Honda. Department of Radkology, Miyazaki Medical College. Miyazaki

Volume and activity of liver and spleen were calculated in 46 patients with diffuse liver disease and 22 normal individuals using SPECT system (MaxiCamera 400T equipped Gamma 11). Each patient recieved 6mCi of Tc-99m phytate. In 28 cases out of 68, volumes were also calculated by X-ray computed tomography (CT/T 8800).

The correlation coefficient was good ($r=0.992$) between SPECT-volume and XCT-volume. The regression equation was $Y=1.16X+11.6$, where Y was SPECT-volume and X was XCT-volume.

In order to evaluate the usefulness of SPECT in the diagnosis of diffuse liver diseases, the spleen-to-liver (S/L) ratios of volume, activity and activity/volume were calculated. In the normal individuals, S/L ratios of SPECT-volume was $8.9 \pm 4.9\%$, those of activity were $3.7 \pm 2.5\%$ and those of activity/SPECT-volume were $36.5 \pm 17.5\%$. In the patients with diffuse liver diseases, S/L ratios of formentioned three parameter were significantly high ($P<0.001$) in comparison with normal cases. Especially the patients with liver cirrhosis were clearly differentiated from normal cases by those three parameter.