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THE EXAMINATION OF POSITIVE IMAGES ON GA-67 CITRATE SCINTIGRAPHY USING ORGAN/THIGH COUNT RATIOS. S.Yoshioka, K.Yamada, J.Hatazawa T.Matsuzawa Dept. of Radiology & Nuclear Medicine, The Research Inst. for Tuberculosis & Cancer, Tohoku University. S.Itagaki A.Oonae, Y.Sasaki Sasaki Hospital.Furukawa

A method for quantitative analysis of positive images on gallium-67 tumor scintigraphy was examined. The method was applied to the image processing on gallium scintigraphy. With rectilinear images on gallium-67 citrate scintigraphy, square regions of interest were settled on brain, lung, mediastinum, liver and thigh. The counts in each region were measured and the count ratios of those organs to thigh were calculated. In all subjects brain to thigh ratios were in range from 0.9 to 1.9 (S.D. 0.32). It seemed that lung and mediastinum to thigh ratios in normal subjects were distributed according to normal distribution. By means of these ratios, upper and lower cut levels on reconstructed images can be selected about brain, lung and mediastinum and better visualization can be gotten with the images settled cut level. In addition we apply the same method to spot images. The method for drawing outline on these images settled cut levels were also devised. The series of image processing can be performed within a minute on computer program.

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GALLIUM ACCUMULATION IN THE LIVER OF VARIOUS DISEASE. R.Kawai, A.Yosnitake, C.Ishii, M.Tsukioka, Y.Mori, N.Katsuyama, and K.Kawakami Dept of Radiology, Jikei Univ. School of Medicine. Tokyo

The radioactivity of gallium in the liver was compared as reference to background activity on 359 Ga-67 scan performed on various diseases. The accumulation of gallium in the liver were hardly seen in 12 cases out of 359 study, and slightly seen in 19 cases. These 31 cases consist of 12 liver cirrhosis (LC), 2 chronic liver diseases, 5 malignant lymphomas, 9 malignant tumors of the liver and 2 miscellaneous hepatic diseases. Five cases (4 of them had LC) among these 31 cases showed gallium accumulation in kidney also. Twelve cases had been treated with chemotherapy against malignant lymphoma and malignant tumors. Four out of the 12 cases of LC associated with hepatoma and only one case showed a cancerous gallium accumulation. For these cases with hepatoma, MMC has been injected into hepatic artery. This result indicates that gallium accumulation in the liver appears to be decreased in LC and after chemotherapy.

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STUDY ON CASES WITH ABSENT LIVER UPTAKE IN GA-67 SCINTIGRAPHY. S. Ito, T. Gokan, K. Takizawa, Y. Hirono, A. Shinotsuka and T. Hishida Department of Radiology, School of Medicine, Showa University. Tokyo

In the past year, we have found 15 cases with faint or absent liver uptake of Ga-67, and studied their liver scintigraphies by Tc-99m-Sn-colloid and blood chemistry. In liver function test of serum, about two-thirds of cases showed abnormal high value of colloid reactions (TTT, ZTT) that indicated interstitial disturbance of the liver. But few cases showed severe liver dysfunction and 5 cases almost normal liver function. In their liver scintigraphies, about half of cases were in pattern of liver cirrhosis or chronic hepatitis, but 4 cases in almost normal pattern. Therefore, the absent liver uptake of Ga-67 was not correlative with the liver dysfunction, but with iron metabolism. Most of cases showed normal or elevated serum iron, decreased TIBC and markedly decreased UIBC. In contrast, most of cases with increased liver uptake of Ga-67 showed normal or elevated UIBC. Ga-67 binds to serum transferrin and is transported to various tissues. Under the condition of markedly low UIBC, Ga-67 could not bind to transferrin and free Ga-67 could not be transported to tissues but would be excreted from kidney. Thus, it is considered that increase of free Ga-67 brings about decrease of Ga-67 liver uptake.

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3 CASES OF GALLIUM IMAGES IN PATIENTS WITH HEMOCHROMATOSIS AND THE THEORETICAL STUDIES. Y. Ito, Department of Radiology, Kyoto Minami Hospital, Kyoto and R. Morita, Department of Radiology, Kyoto University, Kyoto.

We performed scan after Ga-67 injection in three patients with hemochromatosis. No hepatic, splenic or bone activity is observed all of them. Only kidney and some bowel activity are detectable. This abnormal pattern of Ga-67 localization in patients with hemochromatosis supports the concept that Ga-67 acts in certain respect as an iron analog. It is said that after intravenous injection, Ga-67 is bound primarily to transferrin and then transported to intracellular particles. Iron competes with Ga for binding site on transferrin.

The binding constant of Ga-transferrin is lower than that of Iron-transferrin.

As UIBC is very low in patient with hemochromatosis, Ga can bind transferrin little.

This is the reason why no hepatic or bone activity is observed in patient with hemochromatosis.