

Scintigraphy of Lung Cancer Using $^{203}\text{Mercury}$ Pretreated with Glutathione

M. IIO, M. HIRATA, T. HARA and H. BABA

National Nakano Chest Hospital, Tokyo

Recently the scintillation scanning of chest using radioactive mercuric chloride has been proved to be useful as a screening method for the detection of lung cancer. Now one of the difficulties for wide application of this method is the poor resolution of scintigraphy. The blur of the scintigram is partially due to the high blood level of radioactivity. The lung involves blood vessels so abundantly besides the proper ventilatory tissues, that the radioactivity bound to blood cells and remaining long after the administration is very troublesome for the detection of the radioactivity accumulated in the lesion.

Here we report that mercuric chloride, when mixed with some times the equivalent of glutathione just before the intravenous injection, does scarcely bind with blood cells, and taken up rapidly and preferentially into malignant tissue as the free mercuric chloride or radiomercury Neohydrin. For the routine examination one millicurie of $^{302}\text{HgCl}_2$ is quite enough, and by this method the accuracy of scintigram of lung cancer has been improved.

81 cases suspected malignant lung tumor were examined by this method. The majority

cases of lung cancer (82%) showed hot spots in scintigram, on the other hand the tuberculous cases have the hot spots of 21%.

The mean value of accumulation ratio of radiomercury in malignant lesion is 6.04 ± 4.93 , and the mean ratio in tuberculous cases is 2.49 ± 2.56 .

The autoradiography of the resected lung which was administered the $^{203}\text{mercury}$ with glutathione a day before the operation has revealed that the fixation of the radioactivity was considerable in the malignant tissue of lung.

Conclusion

1) The scintigram with radioactive mercury chloride gives a hyper accumulation of malignant lesion of the lungs.

2) If it is possible to found the lesion which is smaller than the recognized size of the lesions by this method, it is very useful for diagnosis and therapy of lung cancer. Because there are 2 reasons, one of them is pointed out malignant disease without contained non malignant disease with this method, the other of them is expected some good prognosis of therapy of lung cancer.

Scintigraphic Diagnosis of Malignant Lymphoma Using ^{75}Se Selenomethionine

H. MITSUHASHI, Y. KIKUCHI, M. MITA, T. WATANABE and M. WAKABAYASHI

Department of Radiology, Hokkaido University Medical School, Sapporo

^{75}Se selenomethionine is incorporated into protein synthesis in tissues such as the thyroid, the liver, the pancreas, and the bone marrow after intravenous administration.

In 1965, Herrera et al reported primarily

that this agent was available for the diagnosis of malignant lymphoma. Administration of the tracer dose of ^{75}Se selenomethionine permitted their demonstration by means of scintigraphic techniques.

We also used this compound to detect the involved areas of 14 patients with malignant lymphoma.

Methods:

The scanning instrument was scintiscanner with a 3 inch crystal and scintillation (Anger) camera. ^{75}Se selenomethionine was employed at a dosis of 100 to 300 μCi . Scans were performed 24 hours after intravenous administration.

The lymphomatous patients of 14 cases consisted of 8 reticulosarcomas, 4 Hodgkin's diseases, and 2 lymphosarcomas. Controls of 10 cases were 4 chronic lymphatic leucemias, 2 neuroblastomas, sarcoid of hilur lymphnodes, Brown tumor of the mandible, Sezary's syndrome, and interstitial pneumonia each.

Results were obtained as follows:

1) 10 cases of malignant lymphoma (7 reticulosarcoma, 2 Hodgkin's disease, 1 lymphosarcoma) showed positive pictures in scintigraphic techniques, while 4 cases showed negative in which 2 cases were performed radiation treatment to mediastinal lesions, and 2 cases were observed less than 3 cm. diameter in the involved lymphnodes.

2) In 10 cases of controls, 3 patients with Brown tumor, Sezary's syndrome and interstitial pneumonia showed positive pictures, while another patients showed negative.

3) In controls, disappearance curve of ^{75}Se selenomethionine in plasma was observed into 3 phases. Biological half life of ^{75}Se selenomethionine was 57.4 days in controls and 8.6 days in patients.