

Clinical Experience of ^{67}Ga -Citrate for Diagnosis of Pulmonary Carcinoma

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In 1969, Edwards and Hayes have reported that ^{67}Ga -citrate was taken in the affected cervical lymphnodes of a patient with Hodgkin's disease. Since then, ^{67}Ga -citrate is being watched with interest as a new radioisotope for diagnosis of pulmonary carcinoma. The present report describes about the clinical application of ^{67}Ga -citrate for diagnosis of pulmonary carcinoma.

The subjects of our study were consisted of ten cases with primary pulmonary carcinoma, each one of metastatic pulmonary carcinoma and malignant lymphoma, each two cases with benign pulmonary tumor and pulmonary abscess, each one of sarcoidosis, pulmonary tuberculosis, pneumoconiosis, and three normal cases.

1.5–2.0 mCi of the ^{67}Ga -citrate with 200 mg of sodium citrate was individually injected intravenously. Whole body linear scanning and pulmonary scanning were carried out 24 and 48 hours after injection.

The lung scan of ten cases with pulmonary carcinoma which tumors were over three cm in diameter showed definite positive shadow of ^{67}Ga -citrate in the affected part with carcinoma. However, there were some cases which size of positive shadow of ^{67}Ga -citrate were

smaller than the tumor shadows seen on the chest X-ray film. The autopsy or operation findings of these cases indicated that small deposit shadow of ^{67}Ga -citrate compared with original tumor shadow of the chest X-ray was brought by diffuse necrosis of the carcinoma lesion. A metastatic pulmonary carcinoma which had several nodular shadows showed only small one deposit of ^{67}Ga -citrate in the corresponding region to a largest tumor shadow (it's diameter was three cm). A case of lymphosarcoma showed small positive shadow of ^{67}Ga -citrate in the mediastinal region. Three normal cases showed no deposit of ^{67}Ga -citrate in the lung fields, and two cases of benign pulmonary tumor also showed negative shadow. All cases of pulmonary tuberculosis, sarcoidosis, pneumoconiosis and pulmonary abscess showed positive shadow of ^{67}Ga -citrate in their affected regions as pulmonary carcinoma showed.

In summary, it was concluded that positive shadow of ^{67}Ga -citrate was shown in not only malignant tumor but also inflammatory disease, but ^{67}Ga -citrate was a recommendable radioisotope for diagnosis of pulmonary carcinoma.

Studies on the Distributions of ^{67}Ga -Citrate in the Patients with Various Pulmonary Disorders

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The evaluation of ^{67}Ga -citrate for the diagnosis of pulmonary disorders was studied in

comparison with ^{131}I -MAA including fundamental experiments using tumor bearing Ehr-

lich ascitic mice in this paper. First of all, the incorporation of ^{67}Ga -citrate into the tumor of mice was not significantly higher than other various organs been comparing with cpm per one gram tissue, although relatively higher cpm incorporation was observed as a whole organ.

Clinically higher incorporation of ^{67}Ga -citrate into the lung cancer was surely observed than the incorporation into foci of pulmonary tuberculosis and pulmonary abscess. Therefore the scanning of ^{67}Ga -citrate was seemed to be useful for the diagnosis of

the cancer in despite of its specificity.

Distinct configurations of pulmonary scanning with ^{67}Ga -citrate was superior than that of ^{131}I -MAA.

The positive delineation coincided with pulmonary silicosis was also appeared with ^{67}Ga -citrate. For the evaluation of the extent and prognosis of pulmonary silicosis ^{67}Ga -citrate in the scanning was valuable, because the configuration of ^{67}Ga -citrate scanning extended to the field beyond the focus possibly defined with x-ray tomography.

Experience in the Scanning of the Tumor with ^{67}Ga -Citrate

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Introduction; Since Edward et al. made their first reports that ^{67}Ga -citrate was taken in the malignant tumor on scintigram in 1969, studies in cases of ^{67}Ga -citrate tumor scanning had reported in Japan.

We had applied the materials in tumor scanning in these half a year and had effective results in diagnosis of the tumor and in radiation therapy in the malignant tumor.

Procedure; We gave patients ^{67}Ga -citrate (1-2 mCi) injection intravenously and scanned 24-72 hours after the injection with RDA-106-6 type scanner made by Toshiba and with colour-scanner in some cases occasionally.

In respect to cases of radiation therapy, we applied scintigrams before, middle and after the radiation therapy.

Conclusion; Now we had examined about 90 cases and reported with our consideration.

Results are as follows

-Table-		++	+	±	—
brain tumor	1	0	0	1	0
Ca. of lung (path.)	21	8	10	1	0
(x-ray exam.)	10	4	3	2	1
(post ope.)	3	0	0	0	3
malignant lymphoma	4	4	0	0	0
mediastinal tumor	4	1	0	0	3
Ca. of esophagus	3	0	1	0	2
Ca. of breast	1	0	1	0	0
(post ope.)	7	0	0	2	5
normal	9	0	0	0	9
pneumonia	4	1	0	0	3
Ca. of uterus	8	0	2	4	2
(post ope.)	3	0	0	2	1
Ca. of rectum	2	0	0	2	0
(with bone metastasis)	1	0	1	0	0
Ca. of liver	2	1	0	1	0
liver abscess	2	0	0	0	2
Ca. of stomach	1	0	0	0	1
Ca. of small intestine	1	1	0	0	0
(post ope.)	1	0	0	0	1
Ca. of kidney	1	0	0	0	1
(post ope.)	1	0	0	0	1