^{67}Ga-citrate disappeared using ^{75}Se-selenomethionine while normal thymic figure was obtained clearly.

The disappearance curve of ^{75}Se-selenomethionine from circulating venous blood of the patients with myasthenia gravis indicated that the minimum level was obtained at 45 minutes after injection followed gradually increased ^{75}Se-selenomethionine level.

The disappearance curve of ^{75}Se-selenomethionine in mice was also studied with the same results. The organ distribution of ^{75}Se-selenomethionine and ^{67}Ga-citrate in mice were studied to prove thymic uptake in human. The maximum uptake in the thymoma was obtained relatively short time, after e.g. 5 minutes, injection of ^{75}Se-selenomethionine. On the other hand the maximum uptake of ^{67}Ga-citrate into the subcutaneous Ehrlich' solid tumor could obtain at 72 hours after injection of ^{67}Ga-citrate.

From above data, the authors considered that the optimum conditions to take thymic scintigraphy was 1) with 300 μCi of ^{75}Se-selenomethionine, 2) from 30 minutes to 60 minutes after injection for thymic hyperplasia, and was 1) with ^{67}Ga-citrate 2—3 mCi, 2) from 48 to 72 hours after injection for thymic tumor.

Diagnosis of Lymphnode Metastases of Breast Cancer By Radioactive Colloids

(With Special Reference to Preoperative Exploration and Relapse-Detection)

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In breast cancer, approach to parasternal lymphnode metastases is not simple from surgical as well as radiodiagnostic standpoint. Roentgenologic lymphography of the parasternal nodes is difficult, if not impossible. In breast cancer patients we attempted scintigraphic exploration of this area with radioactive colloids including ^{99m}Tc-sulfur colloid.

Radioactive colloid was injected deeply into upper anterior abdominal wall on each side of xiphoid process or subcutaneously into dorsum of each hand or each anterolateral chest wall. In most cases 198 Au colloid (average size 30mμ) was injected 100μCi each site and scintigrms were obtained 24 hours later. Recently ^{99m}Tc-sulfur colloid was also used (1 mCi each site after local anesthesia, scintigrams 2 hours later). The advantage of ^{99m}Tc-sulfur colloid is lower radiation dose and better visualization of lymphnodes. When parasternal nodes were visualized equally on each side, we interpreted as normal pattern. Marked

decrease in activity of parasternal nodes on the side of breast cancer was interpreted as metastasis. But faint visualization on both sides or no visualization probably due to technical failure is difficult to interpret. Furthermore, there are some anatomical variations such as solitary parasternal lymphnode chain.

176 cases were examined. (80 cases preoperatively, 92 cases postoperatively and 4 inoperable cases). 34 patients underwent radical mastectomy (including parasternal dissection) after parasternal lymphoscintigraphy. At surgery parasternal metastases were found in 10 patients and 6 of them (60%) had shown scintigrams interpreted by us as metastasis. In the remaining 24 patients parasternal metastasis could not be found and 12 of them (50%) had sohwn normal pattern

Follow-up comparative study of preoperative, postoperative and subsequent parasternal lymphoscintigrams should be of diagnostic and prognostic significance. Second-look lymphoscintigraphy was performed in 17 patients, third-look in 4 patients and fourth-look in one patient. Thus far there has been observed no clinical sign of relapse in parasternal nodes of these patients. However it is of interest that more than half of follow-up cases showed overall reduction of activity accumlation in comparison with previous lymphoscintigram. The cause thereof is yet unknown though it should be noted that some of these cases had received postoperative radiaction treatment.

On Protein-Binding of ^{67}Ga-Citrate

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Human blood serum was incubated with ^{67}Ga-citrate in vitro, and the mixture was fractionated through Sephadex. The radioactivity in the eluate was located at V_0 and at the total bed volume. V_0 fraction was further fractionated through Sephadex G200 and it was found that the radioactiivity was eluted at the position corresponding to the third peak of the serum protein. It was found that ^{59}Fe-labelled peak as well as ^{111}In-labelled peak appeard at the same possition.

These results indicate that ^{67}Ga binds with serum transferrin, however, it was found that Ga-protein binding is far less stable than that of Fe and In, as it was shown by gelfiltration that the protein-bound radioactivity is dissociated by repeated gelfiltration. Ga-protein binding is unstable also to the addition of acid and it completely dissociated by the addition of 5% trichloracetic acid, or, it is unstable to increased ionic strength of the solution. These characteristics have hitherto mede the identification of Ga-transferrin binding difficult, either by electrophoretically, or by other methods.

The authors are skeptic to the concept of Ga binding with cyclic AMP-dependent phosphodiesterase (Fujino 1973), because they measured the Ga-bound protein by Milipore filter of 0.45 μM. Since we found that In-111 bound protein passes through Milipore filter of 0.22 μM, we believe that the Ga-protein will also behave like it. Further investigation is in progress.