Clinical Study on Lung Scans with $^{99m}$Tc-Bleomycin

S. Nomura, Y. Ishitii, H. Ito, N. Nezumi and K. Torizuka

Department of Radiology
T. Mori, K. Hamamoto and T. Fujita

Central Clinical Radioisotope Division
Kyoto University School of Medicine, Kyoto

Recently we have succeeded in the effective labeling of Bleomycin, an anticancer drug, with $^{99m}$Tc, and experimental and clinical studies revealed an unusual and specific affinity of this $^{99m}$Tc-Bleomycin to various malignant tumors.

We performed lung scans with $^{99m}$Tc-Bleomycin in 40 cases with various lung diseases, and images obtained from $^{99m}$Tc-Bleomycin were compared with those obtained simultaneously from $^{67}$Ga-citrate.

All of 23 primary lung cancers showed positive scans with $^{99m}$Tc-Bleomycin, but $^{67}$Ga-citrate failed to show positive results in 2 of these cases.

Also, all of 2 metastatic lung tumors showed positive scans with $^{99m}$Tc-Bleomycin, but in one of these cases positive scan was obtained with $^{67}$Ga-citrate.

On the basis of histological findings of primary lung cancers, positive scans with $^{99m}$Tc-Bleomycin were obtained in all cases, but 2 cases of squamous cell carcinomas showed negative scans with $^{67}$Ga-citrate.

Analysis of relationship between lung scans and roentgenographic patterns based on histological diagnosis revealed that mass larger than 1.5 cm showed more highly positive scans with $^{99m}$Tc-Bleomycin in squamous cell carcinomas and adenocarcinomas, pneumonitis and collapse showed more highly positive scans with $^{99m}$Tc-Bleomycin in squamous cell carcinomas, and with $^{67}$Ga-citrate in adenocarcinoma and small cell carcinoma respectively and metastatic lesions to hilus and mediastinum showed highly positive scans with both scanning agents in all cell types.

It was of interest that 4 of 5 pulmonary tuberculosis showed negative results with $^{99m}$Tc-Bleomycin, but 4 of them did show definite accumulation of $^{67}$Ga-citrate.

These clinical results indicate that $^{99m}$Tc-Bleomycin is a valuable scanning agent for the detection of malignant lung tumors. With use of this scanning agent, scintigram can be obtained in a short time. In addition, accumulation in inflammatory changes, especially in pulmonary tuberculosis, seemed to be much less than that of $^{67}$Ga-citrate.