

직장의 중등도 분화성 선암으로부터 전이된 폐결절에서의 Ga-67 섭취

전북대학교 의과대학 핵의학교실,¹ 임상의학연구소,² 의과학연구소³

임 석 태^{1,2,3} 손 명 희^{1,2,3}

Accumulation of Ga-67 in Metastatic Pulmonary Nodules from a Moderately Differentiated Adenocarcinoma of the Rectum

Seok Tae Lim, M.D.,^{1,2,3} and Myung-Hee Sohn, M.D.^{1,2,3}

Departments of Nuclear Medicine,¹ Research Institute of Clinical Medicine² and Institutes for Medical Sciences,³ Chonbuk National University Medical School, Chonju, Korea

Abstract

A 67-year-old woman who had undergone anterior resection for a moderately differentiated adenocarcinoma of the rectum and wedge resection for liver metastasis presented with hematogenous lung metastasis. Metastatic pulmonary nodules in both lung fields were shown on plain chest radiograph and CT. Ga-67 SPECT images revealed accumulation of radioactivity corresponding to the pulmonary nodules. The authors present an unusual case of accumulation of Ga-67 in metastatic pulmonary nodules in a patient with a moderately differentiated adenocarcinoma of the rectum. (**Korean J Nucl Med 2002;36:140-142**)

key words : Ga-67, rectal cancer, adenocarcinoma, metastatic pulmonary nodule

Received Mar. 8, 2002; accepted Mar. 8, 2002

Corresponding Author: Myung-Hee Sohn, M.D.

Department of Nuclear Medicine, Chonbuk National University Medical School

634-18 Keumam-dong Duckjin-gu, Chonju, Chonbuk

561-712, Korea

Tel: 063-250-1174

Fax: 063-250-1588

E-mail: mhsohn@moak.chonbuk.ac.kr

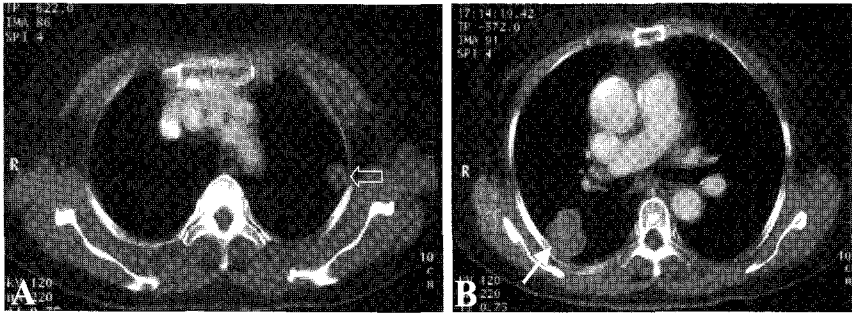


Fig. 1. A 67-year-old woman presented with two well-defined spherical nodules in the left-upper and right-mid lung fields on chest X-ray, which corresponded to hematogenous lung metastasis. The patient had a history of anterior resection and hepatic wedge resection due to a moderately differentiated adenocarcinoma of the rectum with liver metastasis several weeks previously. Contrast-enhanced computed tomography of the chest shows the masses of soft tissue densities with lobulated margins in both (A) the left-upper and (B) right-mid lung zones. Their size were 2 cm-diameter in the left (open arrow) and 3.5 cm-diameter in the right (arrow). Mass densities were not seen in the hilar region corresponding to the increased hilar activities on Ga-67 SPECT images.

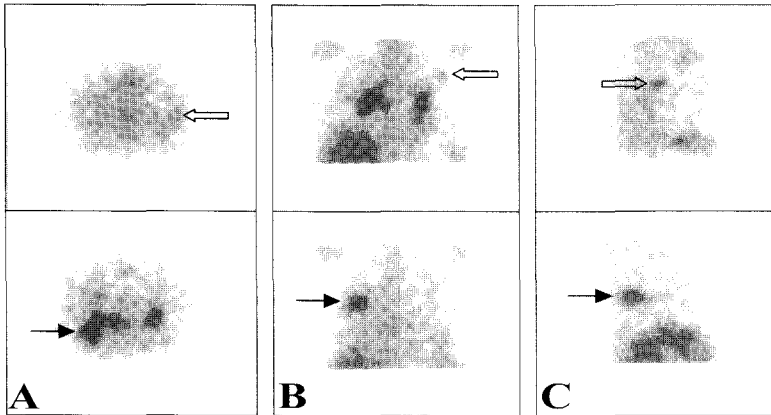


Fig. 2. Ga-67 SPECT was performed 72 hours after intravenous injection of 296 MBq (8 mCi) Ga-67 citrate. (A, B and C) Selected transaxial, coronal, and sagittal SPECT images through the masses in both lungs show increased radioactivity (open arrow and arrow) corresponding to the pulmonary nodules. Bilateral nonspecific hilar uptake was observed.

Ga-67 has been shown to accumulate sufficiently in a variety of tumors to allow for their visualization since 1969 (1, 2). Ga-67 was reliably taken up in lung cancers, with a positive rate of 85%~90% on Ga-67 scintigraphy (3). However, Ga-67 uptake by lung cancers varied somewhat according to the histologic type. It was highest in undifferentiated and squamous cell carcinoma and lowest in adenocarcinoma (4-6). Although there were few reports for accumulation of Ga-67 in metastatic adenocarcinoma of the lung, the positive rate was still as low as the primary one (6).

Ga-67 uptake by a malignant tumor has been proposed to be related to transferrin receptor on the cell surface. Multiple factors probably contributed to tumor uptake. However, the exact mechanism is still unknown (7-9). The factors influencing the uptake include increased vascularity, altered tissue permeability, rate of cellular proliferation, and changes in metabolic activity. The reason for the low accumulation of Ga-67 to adenocarcinoma is not known.

References

1. Edward CL, Hayes RL: Tumor scanning with Ga-67 citrate. *J Nucl Med* 10:103, 1969.
 2. Bekerman C, Hoffer PB, Bitran JD: The role of gallium-67 in the clinical evaluation of cancer. *Semin Nucl Med* 14:296, 1984.
 3. Alazraki N: Usefulness of gallium imaging in the evaluation of lung cancer. *Crit Rev Diagn Imaging* 13:249, 1980.
 4. Thesingh CW, Driessen OM, Daems WT, Franken C, Pauwels EK, Scheffer E, et al: Accumulation and localization of gallium-67 in various types of primary lung carcinoma. *J Nucl Med* 19:28, 1978.
 5. Higashi I, Wakao H, Nakamura K, Shimura A, Yokoyama T, Suzuki S, et al: Quantitative gallium-67 scanning for predictive value in primary lung carcinoma. *J Nucl Med* 21:628, 1980.
 6. Itoh K, Takekawa H, Tsukamoto E, Nagao K, Nakada K, Abe S, et al: Single photon emission computed tomography using Tl-201 chloride in pulmonary nodules: comparison with Ga-67 citrate and Tc-99m labeled hexamethy-propylencamine-oxime. *Ann Nucl Med* 6:253, 1992.
 7. Larson SM: Mechanisms of localization of gallium-67 in tumors. *Semin Nucl Med* 8:193, 1978.
 8. Hoffer P: Gallium: mechanisms. *J Nucl Med* 21: 282, 1980.
 9. Larson SM, Rasey JS, Allen DR, Nelson NJ, Grunbaum Z, Harp GD, et al: Common pathway for tumor cell uptake of gallium-67 and iron-59 via a transferrin receptor. *J Natl Cancer Inst* 64:41, 1980.
-