CASE REPORTS

Gallium-67 Scanning in the Evaluation of Mesothelioma

Richard B. Wolk

Leonard Morse Hospital, Natick, Massachusetts

J Nucl Med 19: 808–809, 1978

Gallium-67 citrate is an effective imaging agent for the evaluation of lesions of the chest, but is nonspecific in the differential diagnosis of the underlying disease process. We recently encountered two cases of mesothelioma in which Ga-67 concentration helped to define the extent of the disease.

Case 1. A 58-year-old man was admitted with a chief complaint of shortness of breath and physical signs of left pleural effusion. There was no evidence of congestive failure. Rapidly recurring left effusions necessitated repeated thoracenteses. Pleural biopsy revealed atypical cells suggesting malignancy. The patient refused further tests at this time, but periodic thoracenteses remained necessary. All of them failed to demonstrate malignancy. He was readmitted 1 mo later and left thoracoscopy revealed multiple pleural and parenchymal nodules 0.5 to 2.0 centimeters in diameters extending to and covering the diaphragm. A Ga-67 scan 6 days later revealed activity over the entire hemithorax, with particular concentration at the left base and mediastinum (Fig. 1).

Case 2. A 62-year-old man was admitted with left pleural effusion. Thoracentesis demonstrated an exudate, and cell block showed papillary clusters and histiologically benign mesothelial cells, Class II. A Ga-67 scan demonstrated activity over the left lung base. The patient was readmitted 1 mo later for recurrent effusions. Pleural biopsy at this time was suggestive of mesothelioma, and thoracoscopy showed pleural tumor at the level of the 6th and 7th ribs. Pleural stripping was considered, but repeat Ga-67 scans demonstrated activity capping the left lung as well as at the left base (Fig. 2). Because of the scan findings, a "mini" thoracotomy was performed, confirming tumor in the pleura and parenchyma at the left base and the pleura capping the left lung. Further surgery was cancelled and chemotherapy was begun.

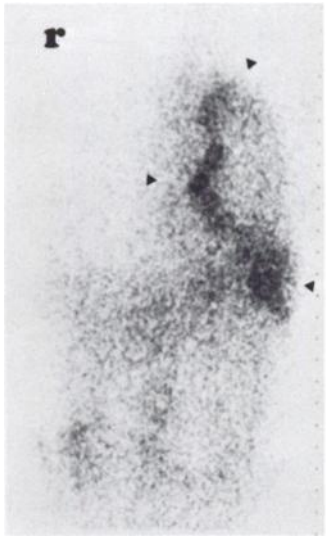

FIG. 1. Anterior supine view obtained 48 hr after administration of 4 mCi Ga-67 citrate. Note mediastinal, left apical, and left basal activity (arrows).

FIG. 2. Anterior supine view obtained 96 hr after administration of 4 mCi Ga-67 citrate. Note left apical, basal, and mediastinal activity (arrows).

In many respects, Ga-67 is an ideal screening agent for chest diseases. It is unusually sensitive and has shown uptake in a variety of conditions affecting the chest. These include infection and inflammation, sarcoid, pneumoconiosis, and neoplasm (*1,2*). Moreover, the actual imaging of thoracic lesions is facilitated by the relatively low background levels

of Ga-67 remaining in the normal tissues of the thorax, compared with those in the abdomen, head, and neck (*3*). This favorable sensitivity and ease of imaging afford the radiologist a convenient and noninvasive screen of all areas of the chest, including those not visible by bronchoscopy, mediastinoscopy, or conventional radiography (*4,5*).

As in our cases, Ga-67 studies may play a significant role in determining ultimate treatment of mesothelioma by defining the true extent of the disease process. In this regard, one wonders whether Ga-67 will also prove useful in monitoring the effectiveness of therapy in mesothelioma, as it has in other lesions.

ACKNOWLEDGMENTS

We thank Stanley Sabin, M.D. and Alfred Kaplan, M.D. for their cooperation in the evaluation of these patients, and William Poplack, M.D. for the review of this paper.

REFERENCES

1. KINOSHITA F, USHIO T, MAEKAWA A, et al: Scintiscanning of pulmonary disease with ^{67}Ga-citrate. *J Nucl Med* 15: 227–233, 1974

2. SIEMSEN JK, SARGENT EN, GREBE SF, et al: Pulmonary concentration of Ga^{67} in pneumoconiosis. *Am J Roent* 120: 815–820, 1974

3. SIEMSEN JK, GREBE SF, SARGENT EN, et al: Gallium-67 scintigraphy of pulmonary diseases as a complement to radiography. *Radiology* 118: 371–375, 1976

4. CELLERINO A, FILIPPI PG, CHIANTARETTO A, et al: Operative and pathologic survey of 50 cases of peripheral lung tumors scanned with 67 gallium. *Chest* 64: 700–705, 1973

5. DELAND FH, SAUERBRUNN BJL, BOYD C, et al: ^{67}Ga-citrate imaging in untreated primary lung cancer: Preliminary report of cooperative group. *J Nucl Med* 15: 408–411, 1974