

## A case of unexpected gallium-67 uptake by sternum in non-hodgkin's lymphoma with pleuritis

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A case of non-Hodgkin's lymphoma with pleural effusion was presented. Pleural effusion is not a common manifestation of this disease and  $^{67}\text{Ga}$ -citrate scintigraphy gave the clue for the diagnosis.

The possibility of malignant lymphoma should be considered in cases with pleural effusion, and we showed that  $^{67}\text{Ga}$ -citrate scintigraphy can be useful in a case with pleural effusion of undetermined cause.

**Key words:** Malignant lymphoma, Pleural effusion,  $^{67}\text{Ga}$ -citrate, Adenosine deaminase

### INTRODUCTION

PLEURAL EFFUSION is a rather rare manifestation of malignant lymphoma.<sup>1</sup> The causes of pleural effusion are varied, but in Japan, we must include tuberculosis in differential diagnosis.<sup>2</sup> This report concerns a case of pleuritis in which the misdiagnosis of tuberculosis was made but unexpected  $^{67}\text{Ga}$ -citrate ( $^{67}\text{Ga}$ ) uptake by the sternum brought the clue for the correct diagnosis of malignant lymphoma.

### CASE REPORT

A 40-year-old male was admitted to our hospital due to left pleural effusion. The relevant laboratory findings on admission were summarized as follows; complete blood count, blood picture, serum electrolytes, liver and renal function tests were normal. The sedimentation rate was 2 mm in 1 hour, CRP was 7.4 mg/dl.

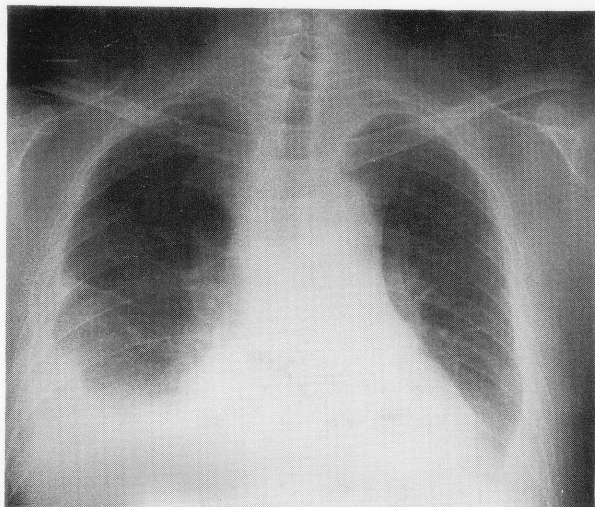
Although cultures of sputa and pleural effusion were negative for tubercle bacillus, the PPD (purified

protein derivatives) skin test was positive ( $24 \times 20$  mm). The pleural effusion was yellowish, turbid and mature lymphocyte dominant, with a high level of adenosine deaminase (ADA) (109 IU/L). Pleuritis tuberculosa was suspected and antituberculous therapy was started. However, in spite of medication for 6 months, the effusion did not decrease and contralateral pleural and pericardial effusion were also recognized (Figs. 1, 2). At this time, no malignant cells could be recognized in the peripheral blood or pleural effusion, and pleural biopsy did not give us any useful information.

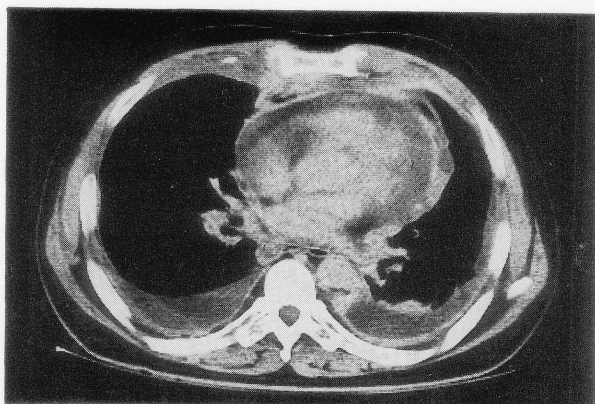
Because of no response to antituberculous therapy and no evidence of the presence of malignant cells by thoracentesis and pleural biopsy, mesothelioma was also considered a possibility. Then  $^{67}\text{Ga}$  scintigraphy was performed<sup>3,4</sup> and we interpreted the resulting images to mean that there existed unexpected abnormal  $^{67}\text{Ga}$  uptake by the whole sternum and hilus pulmonis (Fig. 3 A, B). Consequently bone marrow aspiration of the sternum was performed, and histopathological examination revealed malignant lymphoma (lymphoblastic) (Fig. 4). After chemotherapy with five courses VEPA (Vincristine, Endoxan, prednisolone, adriamycin) in six months, this patient achieved complete remission and subsequent  $^{67}\text{Ga}$  scintigraphy showed no abnormal uptake (Fig. 5).

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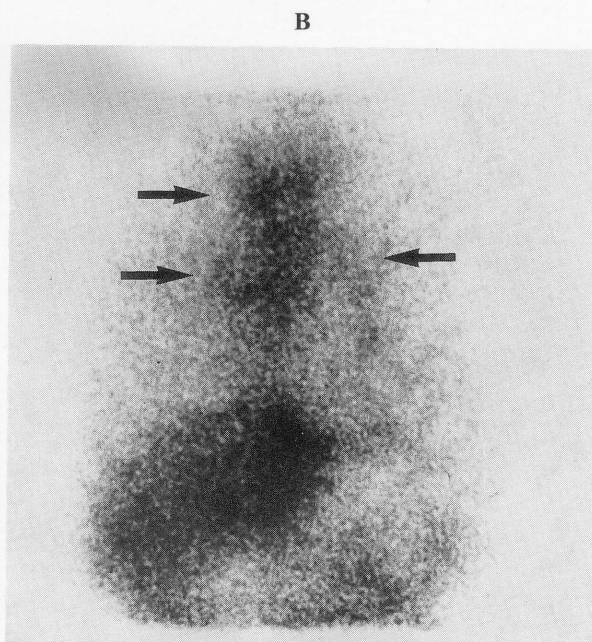
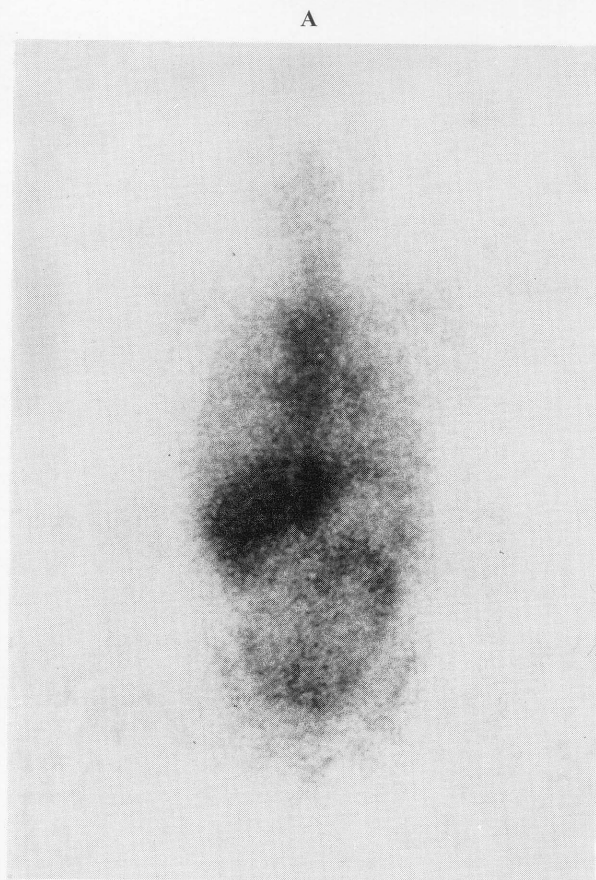
**Fig. 1** Bilateral pleural and pericardial effusion was recognized in spite of 6 months medication. Enlarged hilar lymph nodes also should have been detected.



**Fig. 2** CT scan at the same time of chest film also showed bilateral pleural and pericardial effusion, and enlarged lymph nodes.

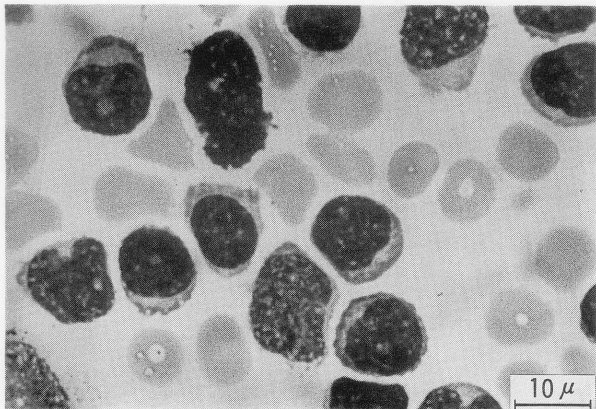
## DISCUSSION

Pleural effusion is not a common manifestation of malignant lymphoma. In this case, because of the character of the pleural effusion, especially high level of ADA<sup>5,6</sup> and absence of malignant cells, misdiagnosis of pleuritis tuberculosa was made and ineffective treatment was continued for a rather long time. Retrospectively, enlarged hilar lymph nodes were visible on the chest films and CT scans and malignant lymphoma should have been suspected. It was the unexpected <sup>67</sup>Ga uptake by the sternum which led us to bone marrow aspiration. Malignant cells in the pleural and pericardial effusion were proved later. Because of the enlarged hilar lymph nodes shown by chest films and CT scans, abnormal <sup>67</sup>Ga uptake by the sternum and hilus, and malignant cells in the pleural and pericardial effusion, clinical diag-

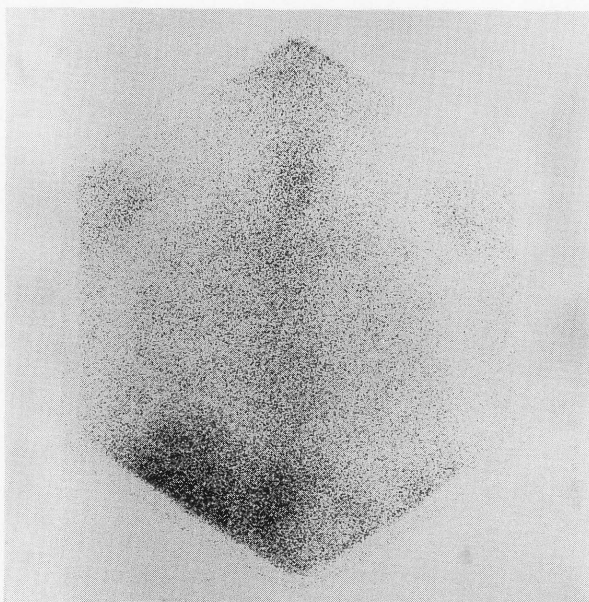


**Fig. 3 A, B** <sup>67</sup>Ga scintigraphy demonstrated strong accumulation in sternum and hilus pulmonis (arrows).

nosis was corrected to the malignant lymphoma originating from the mediastinal lymph nodes with invasion to the sternum, pleura and pericardium (Stage IV).



**Fig. 4** Bone marrow aspiration of sternum revealed malignant lymphoma (lymphoblastic).



**Fig. 5** After chemotherapy, patient achieved complete remission and no abnormal  $^{67}\text{Ga}$  accumulation was recognized.

The usefulness of  $^{67}\text{Ga}$  scintigraphy in malignant lymphoma is well known,<sup>7</sup> and in this case  $^{67}\text{Ga}$  scintigraphy was the best diagnostic procedure, although the enlarged lymph nodes should have been detected sooner.

In conclusion, we suggest that the possibility of malignant lymphoma should be kept in mind in cases with pleural effusion. We have demonstrated that  $^{67}\text{Ga}$  scintigraphy is useful in the investigation of pleural effusion of undetermined cause.

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