Sarcoidosis and malignant neoplasm are frequently encountered pulmonary diseases, but their combined existence in the same patient is rare. As sarcoidosis usually presents as mediastinal lymphadenopathy, its concurrence in lung cancer patient radiologically mimics mediastinal metastasis and this can be possibly interpreted as unresectable disease. We report here on a case of lung adenocarcinoma associated with sarcoidosis that developed in a 64 year-old male who underwent surgical resection. Radiological examinations revealed 5.7 cm-sized mass in the right upper lobe with an enlargement of the bilateral supraclavicular, highest mediastinal, subcarinal and the upper and lower paratracheal lymph nodes. Histological examination showed a well differentiated adenocarcinoma with non-caseating epithelioid granulomas in the lung. The enlarged peribronchial and mediastinal lymph nodes also revealed sarcoid granulomas without cancer metastasis. A good prognosis may be expected for those cases of lung cancers with non-caseating granulomas in the regional lymph nodes. The patient presently has no symptoms or signs of tumor, without further treatment since his surgery.

Key Words: Sarcoidosis; Adenocarcinoma; Lymph Node

CASE REPORT

A 64 year-old man, a nonsmoker, was discovered to have an abnormal shadow on his roentgenogram during a periodic medical check up. Pulmonary tuberculosis was suspected and it was recommended that he take medicine at a private hospital. After three weeks of anti-tuberculous medication, he admitted to the general hospital for further evaluation. A sputum study for Ziehl-Neelsen staining was performed and no acid fast bacilli were identified. A chest computerized tomography (CT) showed a 5.7 cm-sized mass in the right upper lobe. Bronchoscopic biopsy revealed adenocarcinoma. He was transferred to our hospital for treatment of lung cancer. A chest CT revealed a tumor located in the right upper lobe (Fig. 1A) and an enlargement of the bilateral supraclavicular, highest mediastinal, subcarinal and upper and lower paratracheal lymph nodes (Fig. 1B). The CT also revealed multifocal plaques in both pleura and ground-glass opacity in the subpleural portion of both lower lobes (Fig. 1A). To determine the clinical stage, mediastinal lymph node biopsy was performed by video assisted thoracoscopic surgery. None of the lymph nodes demonstrated metastasis. Epithelioid granulomas without caseous necrosis were observed in the dissected
lymph nodes. The stage was estimated as IB (T2N0M0). An elevated level of angiotensin-converting enzyme (ACE) (80.5 μ/L, normal value: 8-52 μ/L) was noted on the preoperative examination.

A right upper lobectomy was performed, and microscopically the tumor was well differentiated adenocarcinoma with a bronchioloalveolar pattern (Fig. 2A). The remaining lung tissue showed multiple non-caseating granulomas distributed in the interstitium (Fig. 2B) and along the subpleura. A characteristic distribution along the lymphatic pathways was observed (Fig. 3A). The granulomas were often present in the tumor and they consisted of clusters of epithelioid histiocytes and multinucleated giant cells surrounded by lymphocytes or hyalinized fibrosis without necrosis (Fig. 2B). A number of nonspecific cytoplasmic inclusions were present within the granulomas and the histiocyes, and these including asteroid and Schaumann bodies (Fig. 3B, C). Large, polarizable crystalline structures were also observed (Fig. 3D). A granulomatous vasculitis-like lesion was present and it was characterized by non-necrotizing granulomas within the intima and media of blood vessels without necrosis of the vessel walls (Fig. 4). We didn’t perform a tuberculosis polymerase chain reaction (Tb-PCR) study.

The patient is now under follow-up at an outpatient clinic without any postoperative chemotherapy or radiation therapy and his disease has been stable for 20 months.

**DISCUSSION**

Several cases with concurrent sarcoidosis and lung cancer have
been reported. In most of these cases, sarcoidosis was present for some years preceding the development of lung cancer. Simultaneous detection of both diseases, as in our case, is much rarer. In this situation, it is sometimes difficult to determine whether sarcoid-like granulomas coexisting with lung cancer represent a sarcoid reaction or true sarcoidosis.

In those individuals without any signs or symptoms of systemic sarcoidosis, localized epithelioid granulomas could be found either in the regional lymph nodes or in the primary tumor itself, and these changes have been previously reported in terms of sarcoid reaction. The present case showed no evidence of systemic sarcoidosis except in the resected lung and the regional lymph nodes. Even though the radiologic findings were characteristic, it is necessary to confirm the presence of granulomatous lesions in at least two different organs to meet the criteria for sarcoidosis. This case should be diagnosed as sarcoidosis because the sarcoid granuloma involved not only in the regional lymph nodes, but it was also scattered in the resected right upper lobe. The histological findings of some cytoplasmic inclusions and...
the characteristic interstitial and subpleural involvement without adjacent alveolar inflammation are features that are more supportive of sarcoidosis rather than a sarcoïd reaction. In addition, some laboratory abnormalities were detected. The serum ACE level to judge the activity of sarcoidosis was elevated, and the diffusing capacity on the pulmonary function test was slightly decreased (80% of the predicted value, and then it was corrected to 85% of the predicted value).

Sarcoïd-like granulomatous lesions have been observed in various kinds of diseases, and their relationship with malignant disease was first reported in Hodgkin’s disease.12 The presence of sarcoïd reactions in the regional lymph nodes in association with malignancies of various organs was reviewed by Gregori et al.13 and Brincker.14 Laurberg1 concluded that sarcoïd reaction to tumors and sarcoidosis differed in their immunopathogenesis, and this was based on their observation that intragranulomatous B lymphocytes were present in lymph nodes in 13 of 15 persons with sarcoïd reactions and in none of the 12 persons with sarcoidosis.

The regional non-caseating granulomatous responses in cancer patients have been associated with an improved prognosis. O’Connell et al.15 reported that the patients with splenic or hepatic non-caseating granulomas had fewer relapses and longer survival than the 74 patients without granulomas, though the patients did not appreciably differ with respect to their pretreatment indices. In addition, the presence of epithelioid granulomas in association with Hodgkin’s disease may reflect a host response to the tumor along with there being favorable prognostic implications.16 Sacks et al.16 reported similar findings in surgically staged patients: the 5 year survival and 5 year relapse free survival were substantially higher in the 55 persons with Hodgkin’s disease and who exhibited splenic or hepatic non-caseating granuloma than in the 553 patients who did not exhibit this finding. Brincker14 reported that in six series of patients with local sarcoïd reactions to solid malignant neoplasm, malignancy was four times more likely to be absent than present within the lymph nodes, suggesting that they were preferentially spared.

The co-existence of lung cancer with sarcoidosis involving the lung and mediastinal lymph nodes, as was seen in the present case, possibly causes clinically misinterpretation as unopposable advanced disease. A few enlarged lymph nodes on radiologic examination may delude clinicians to believe that it would be metastatic lung cancer, and so they decline to operation. Ota et al.17 have recently compared the correlation between the clinical regional lymph node metastasis (cN) diagnosed by CT scan and the pathologic regional lymph nodes metastasis (pN) diagnosed in 244 cases of pulmonary adenocarcinoma. Twenty-seven patients (14%) had pN 2-3 disease out of the 193 patients with cN0. Therefore, physicians need to perform biopsy for enlarged lymph nodes to determine whether or not they contain metastasis.

In summary, the simultaneous occurrence of sarcoidosis and lung cancer in the same patient is extremely rare and a variety of solid and lymphohematogenous malignancies can elicit a granulomatous response that is virtually indistinguishable from sarcoidosis. This association confirms a favorable prognosis in some instances, which is presumably due to immunological suppression of tumor growth. The diagnosis of metastatic malignancy should be confirmed in patients who exhibit clinical and radiographic findings that are consistent with sarcoidosis in order to forestall inappropriate therapy.

**REFERENCES**


