Pulmonary Sarcoidosis: Classic Radiographic Finding

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ABSTRACT

We present the classic image findings of pulmonary sarcoidosis which is a rare disease in our country. A 31-year-old woman presents with an abnormal annual check up chest radiograph, which showed bilateral, symmetrical hilar nodes and a right paratracheal node enlargement without abnormal lung parenchyma. The physical examination, complete blood count, and blood chemistry, were unremarkable. Although many diseases can present with this abnormal image finding, but the combination of the nodal group involvement, the presence of intranodal calcification and nodal enhancement pattern, along with other pertinent positive findings on the chest CT scan, the diagnosis could be made.

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A 31-year-old woman, office worker, who has underlying idiopathic thrombocytopenia and has been in complete remission for 4 years, had an abnormal routine chest radiograph. The physical examination, complete blood count, and blood chemistry, were unremarkable. Her chest radiograph shows bilateral, symmetrical hilar nodes and a right paratracheal node enlargement without abnormal lung parenchyma (Fig 1). A thin-slice CT scan of the chest showed multiple enlarged mediastinal and hilar lymph nodes some of which have calcification. Multiple small subpleural and peribronchovascular nodules are present. Following contrast injection, there was no lymph node enhancement (Fig 2).

DISCUSSION

The differential diagnosis for bilateral hilar lymph node enlargement includes primary tuberculosis, lymphoma (especially Hodgkin's lymphoma), and sarcoidosis, but the prevalence of nodal group involvement, the presence of nodal calcification, and the pattern of nodal enhancement are different among these diseases.

Mediastinal lymphadenopathy is present in 90% of patients with Hodgkin's lymphoma who has intrathoracic involvement at presentation with anterior mediastinal and paratracheal lymph nodes most frequently involved. Hilar lymph node enlargement in the absence of the mediastinal involvement is rare.[1]

In contrast to children, lymphadenopathy is an uncommon presentation of primary tuberculosis in immunocom-

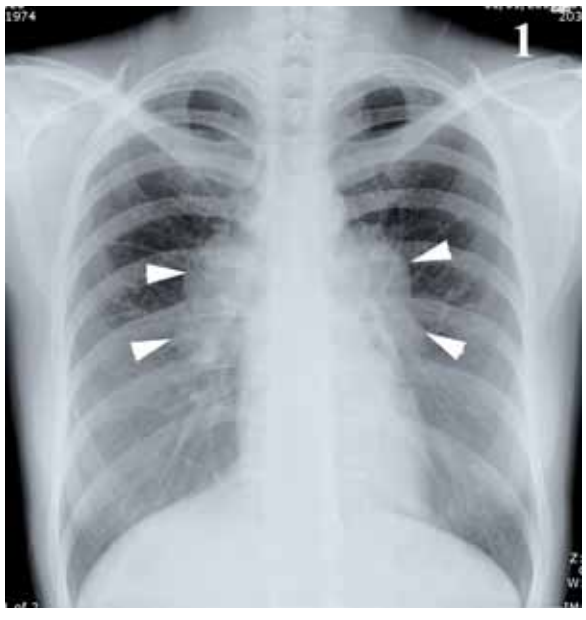

Fig 1. Chest radiograph shows symmetrical bilateral hilar lymph node enlargement.

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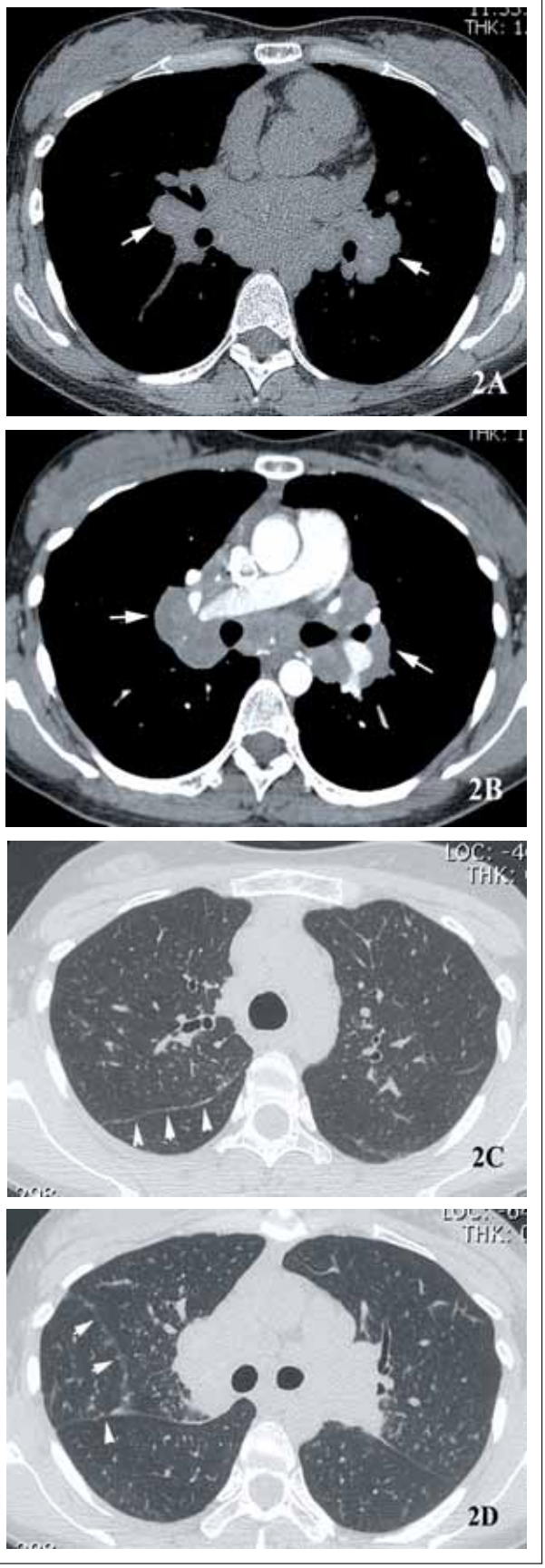

Fig 2. Chest CT scanning of this patient. In mediastinal window both pre- and post contrast (2A and 2B, respectively), bilateral symmetric hilar and subcarinal lymphadenoapthy is present (arrows). The intranodal calcification is seen in the precontrast scan. Multiple subpleural nodules are noted in the lung window (2C and 2D), including along the right major fissure (arrowheads).

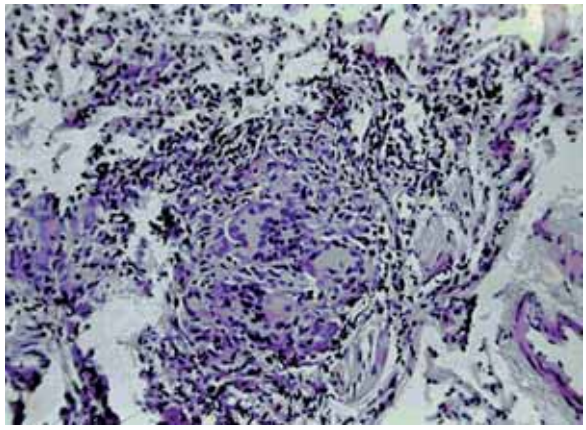

Fig 3. In H&E stain, sarcoid granuloma consists of epithelioid histiocytes and multinucleated giant cells.

petent adults. When present, unilateral lymphadenopathy is more common than bilateral hilar lymphadenopathy, and enlargement of hilar and right paratracheal nodes is the most common. Lymph nodes actively infected with M. *tuberculosis* quite commonly have central low attenuation from necrosis on contrast-enhanced CT.[2]

Lymphadenopathy in sarcoidosis typically involves bilateral hilar and mediastinal lymph nodes and is often symmetric. Enlargement of bilateral hilar and right paratracheal lymph nodes nodes, also called "Garland's triad" or "1-2-3 sign", is a nonspecific chest radiographic pattern that is common in patients with sarcoidosis.[3,4] Typically calcified lymph nodes indicate prior granulomatous infection such as tuberculosis, histoplasmosis, and other fungal infections, but not sarcoidosis. The pattern of calcification can be faint coarse, or even eggshell. Following treatment, involved lymph nodes in Hodgin's lymphoma can calcify.[5]

Although many diseases can present with mediastinal node enlargement, bilateral hilar and mediastinal lymphadenopathy in conjunction with the nodules along the perilymphatic distribution (including subpleural and peribronchovascular nodules), indicate sarcoidosis is the most likely diagnosis. Lung biopsy was performed, and multiple noncaseating granulomas were identified along the pulmonary lymphatics within the interstitium, interlobular septa, around bronchovascular bundles, and pleura. These granulomas consisted of well formed clusters of epitheloid histiocytes and multinucleated giant cells (Fig 3). These histopathologic findings are compatible with sarcoidosis.

Sarcoidosis is a multisystemic, idiopathic, granulomatous disorder, predominantly affecting the lung. The characteristic radiographic features of sarcoidosis are mid- and upper-lung zone perilymphatic nodules (peribronchovascular and subpleural) and/or hilar and mediastinal lymphadenopathy. Chest radiographic grading system as shown in Table 1 provides a rough prognosis for the persistence of respiratory symptoms. Patients with grade 0-1 most often have an excellent, long-term prognosis. Grade 2 has an intermediate long-term prognosis. Patients with grade 3 and 4 radiographic staging are likely to have persistent or progressive respiratory symptoms.[6]

High resolution computed tomography (HRCT) of the chest is more sensitive for detecting disease, especially with radiographic grade 1. The typical HRCT findings in sarcoidosis are well-defined small nodules predominantly in mid and upper lung zones. These nodules are frequently found along the interlobular septa, peribronchovascular

TABLE 1. Chest radiographic staging system for sarcoidosis.

Stage 0	**Normal chest radiograph**
Stage 1	Hilar and/or mediastinal lymphadenopathy without interstitial disease
Stage 2	Hilar and/or mediastinal lymphadenopathy with interstitial disease
Stage 3	Interstitial disease without hilar or mediastinal lymphadenopathy
Stage 4	Advanced lung fibrosis

interstitium, and interlobar fissures. The pattern of lymph node involvement in sarcoidosis is described above. Lymph node calcification is visible 25-50% on a CT scan and may be hazy or dense or show a stippled or eggshell appearance[3]. The only disease that mimics this radiographic feature with sarcoidosis is berylliosis. Therefore, the history of exposure plays an important role in diagnosis.

Clinical course

Because this patient was catergorized as grade 1 sarcoidosis due to the chest radiograph criteria, her spirometry, lung volume, and diffusing capacity were all within normal limits. She was informed about the natural course and prognosis of this disease. No specific treatment was offered, and she remained in good health during the follow-up period of 12 months. The recent chest radiograph remained unchanged.

CONCLUSION

As sarcoidosis is uncommon in Thailand, patients who present with hilar and/or mediastinal lymph node enlargement could be misdiagnosed with other, more common diseases such as pulmonary tuberculosis. However, when the "classic" radiographic finding of symmetrical bilateral hilar enlargement along with subpleural nodules are observed, the diagnosis of sarcoidosis should be entertained. HRCT findings can be highly suggestive.

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