Pulmonary Sarcoidosis: Report of Four Cases

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Sarcoidosis is a systemic disease of unknown etiology. Four cases of histologically proved sarcoidosis are undergone chest radiography and high-resolution computed tomography in 13 months. Bilateral hilar lymphadenopathy is the most common radiographic finding. Other characteristic findings include interstitial lung disease, calcification of affected lymph nodes, and pleural effusion and thickening [1].

High-resolution computed tomography is more sensitive than chest radiography in detecting the presence and extent of pulmonary sarcoidosis. Typical findings include small nodules in a perilymphatic distribution along the peribronchovascular bundles, adjacent to the interlobular septa and subpleurally including the fissure [2,3].

**Key words:** Pulmonary, sarcoidosis; Pulmonary, interstitial; Pulmonary, high resolution CT

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**CASE REPORTS**

CT scans of four patients were performed with a Hi-Speed CTi (General Electric Medical Systems, Milwaukee, WI, USA). Imaging parameters were: scan time, 1sec; section thickness, 1mm; and interslice gap, 10mm. Scanning was performed from the apex of the lung to the diaphragm. All patients were in a supine position.

**Case 1**

A 58-year-old woman with hypertension and gouty arthritis who had been taking oral NSAID for 1 year, was admitted to our hospital for impaired renal function. She had a papule on the right inner canthus. Skin biopsy showed chronic granulomatous dermatitis.

Chest radiography showed bilateral hilar enlargement (Fig 1A). High-resolution computed tomography scans showed interlobular interstitial thickening and subpleural nodules (Fig 1B). There was enlarged bilateral hilar and mediastinal lymphadenopathy (Fig 1C). Renal echo revealed parenchymal disease. Renal biopsy showed chronic interstitial nephritis with non-caseating granulomas. After discharge, she took oral prednisolone daily for declining renal function.

**Case 2**

A 29-year-old woman was well before and a
health examination revealed abnormal chest radiography.

Chest radiography revealed fine reticular lung markings (Fig 2A). HRCT scans showed nodular peribronchovascular interstitial thickening, subpleural nodules, fibrotic change and traction bronchiectasis over the bilateral upper lung fields (Fig 2B). No enlarged mediastinal or hilar lymph node was found (Fig 2C). Video-assisted thoracoscopic surgery (VATS) with wedge biopsy showed granulomatous inflammation with small foci of non-caseating necrosis. She was lost to follow-up afterward.

Case 3
This patient was a 47-year-old woman who had a dry cough for 1 month. She had no history of respiratory tract infection.

Chest radiography revealed right paratracheal and bilateral hilar lymphadenopathy. Subtle fine reticular lung markings were noted (Fig 3A). HRCT scans showed interlobular interstitial thickening and subpleural nodules (Fig 3B). Mediastinal and bilateral hilar lymphadenopathy was noted after contrast enhancement (Fig 3C). VATS showed granulomatous inflammation. No caseous necrosis was seen. She was followed up in the outpatient department without any medication.

Case 4
A 44-year-old woman had erythema nodosum and polyarthropathy. She had a cough with yellowish sputum for 3 months.

Chest radiography revealed bilateral hilar enlargement and normal lungs (Fig 4A). HRCT scans showed subpleural nodules (Fig 4B). Enlarged bilateral hilar and mediastinal lymph nodes were found after contrast enhancement (Fig 4C) VATS showed non-caseating granulomatous inflammation. She was followed up regularly in the outpatient department without medication.

DISCUSSION
Sarcoidosis is a systemic disease of unknown etiology characterized histologically by the presence of non-caseating granulomas in the absence of mycobacterial or fungal organisms [4]. The non-caseating granulomas of sarcoidosis are...
Figure 2. Case 2, a 29-year-old woman. a. Chest PA view shows fine reticular lung markings. b. HRCT shows nodular thickening of the peribronchovascular bundles (white arrow), and fibrotic change with traction bronchiectasis (white arrowhead). Subpleural nodules (black arrow) are also noted. c. HRCT with mediastinal window shows no enlarged mediastinal lymph node.

Figure 3. Case 3, a 47-year-old woman. a. Chest PA view shows bilateral hilar and right paratracheal lymphadenopathy. Fine reticular lung markings are noted. b. HRCT shows subpleural nodules (black arrow), and interlobular interstitial thickening (white arrow). c. Contrast enhancing CT with mediastinal window shows enlarged mediastinal and bilateral hilar lymph nodes.
largely confined to the interstitial compartment of the lungs and show a perilymphatic distribution along the bronchovascular bundles, interlobular septa, and pleura [6,7]. At diagnosis, about 50% of patients are asymptomatic, 25% complain of cough and dyspnea, and 25% have skin lesions (erythema nodosa, lupus pernio, plaques or scar) or eye symptoms [1]. Two of our patients had skin rashes, one was asymptomatic and 2 complain of cough.

The disease is more common in western countries. There is a particularly high prevalence in Africans women. The disease is uncommon in southeast Asia and Japan. It is especially rare in Chinese. In one mass community radiographic survey of 3.6 million people in Taiwan, no cases of sarcoidosis were identified [4]. Strangely, we collected four cases within 13 months.

Bilateral hilar adenopathy is the most common radiographic finding. Other characteristic findings include interstitial lung disease, occasional calcification of the affected lymph nodes, pleural effusion and thickening[1]. Case 1 who had no pulmonary pathologic proof had the typical chest radiographic findings of enlarged mediastinal and bilateral hilar lymph nodes. Three of our cases had hilar or mediastinal lymph nodes. One had fine reticular lung disease, and one had diffuse reticular lung disease. The radiographic changes in pulmonary sarcoidosis are classified into 4 stages: stage 0- no demonstrable abnormality, stage I- hilar and mediastinal lymph node enlargement unassociated with pulmonary abnormality, stage II- hilar and mediastinal lymph node associated with pulmonary abnormality, stage III- diffuse pulmonary disease unassociated with node enlargement [4]. Two of our cases were stage I (cases 1 and 4), one was stage II (case 3), and one was in stage III (case 2). The main utility of the staging system is predicting outcome on follow-up [4]. Sixty-five percent of patients with stage I disease show resolution of the radiographic findings, compared with 49% of patients with stage II disease and only 20% with stage III disease.

The therapy of choice for sarcoidosis is glucocorticoids. Sarcoidosis can clear spontaneously without any treatment in about 50% of cases. For pulmonary sarcoidosis, therapy
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is dependant on history, physical findings, chest X ray and pulmonary function test. Two of our patients (case 3 & 4) are regularly followed up at outpatient department without medication. Smaller mediastinal and bilateral hilar lymph nodes were noted on chest PA view. Case 1 took oral prednisolone daily for declining renal function. Case 2 was lost to follow-up.

The most characteristic HRCT abnormalities in patients who have sarcoidosis consist of small nodules in a perilymphatic distribution along the peribronchovascular bundles, adjacent to the perihilar vessels and bronchi, the fissures, the costal subpleural regions, the interlobular septa, and the centrilobular region [2,3]. Three of our patients had interlobular septal thickening, 1 had peribronchovascular interstitial thickening, and 3 had nodules over the fissure and subpleural region. Fibrosis with traction bronchiectasis was noted in one patient. Pulmonary abnormality was much better assessed by HRCT than chest radiography in our cases.

CT is more sensitive than chest radiography in detection of adenopathy and subtle parenchymal disease [1]. Bilateral hilar lymph node enlargement is the most common manifestation in thoracic sarcoidosis. The right paratracheal lymph node is the second most common location. Other common sites are the aortopulmonary window and the subcarinal region. Anterior mediastinal lymphadenopathy is seldom present. [4,8]. The left paratracheal, the aortopulmonary window, and the anterior mediastinal nodes are easily demonstrated by CT [1]. Three of our cases had bilateral hilar and right paratracheal lymphadenopathy, and AP window and subcarinal lymphadenopathy. Anterior mediastinal lymphadenopathy was found in one case. But no calcified lymph nodes were found.

HRCT is superior to chest radiography in detecting and showing the extent of pulmonary sarcoidosis. It can demonstrate early pulmonary fibrosis and parenchymal distortion. The presence of pulmonary fibrosis is generally associated with poor pulmonary function and poor prognosis with increased morbidity and mortality [9]. HRCT is a good guide when selecting the best biopsy site in an uncertain sarcoidosis. Moreover it is also a good guide for response to corticosteroids [9].

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肺部類肉瘤病：四病例報告

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類肉瘤病是一種不明原因之系統性疾病，共四個組織學上證明為類肉瘤的病例在十三個月中
經胸部素片及高解析電腦之檢查。兩側肺門之淋巴腺病是最常見之放射學上發現，其他特
色的發現包括：間質性肺病、淋巴結鈣化、肋膜積水及變厚。

高解析電腦素片比一般之胸部素片對於偵測肺部類肉瘤病有更高的偵測力；其典型的發現
為，沿著氣管血管束之淋巴分佈周圍有著小結，毗連於肺小葉間隔、肋膜下、及肺裂。

關鍵詞：肺部，類肉瘤病；肺部，間質；肺部，高解析電腦斷層