1. Introduction

Sarcoidosis is a multi-systemic inflammatory disease in which epithelioid cells accumulate and non-caseating granulomas are formed. The lungs, eyes, and skin are the most commonly affected organs, but sarcoidosis has the potential to affect all organs. The diagnosis of sarcoidosis is based on histologic evidence of non-caseating granulomatous and exclusion of other causes of granulomas, such as tuberculosis, especially in China. In recent years, high-resolution CT (HRCT) has gained importance in the diagnosis of sarcoidosis. We report the case of a patient who presented with very few symptoms and signs of sarcoidosis; HRCT revealed large-scale ground glass opacity and minor lymphadenopathy. Bronchoalveolar lavage fluid contained turbid liquid. Sarcoidosis could be confirmed only based on pathological examination of the resected tissue. The patient was administrated prednisone at 40 mg/d orally with tapering of the dose. Lung HRCT scans taken 6 months after the prednisone treatment showed ablation of the ground glass opacity. This case report sheds light on an atypical HRCT presentation of sarcoidosis; the findings here will be useful for the early diagnosis of sarcoidosis and prevention of fatal complications.

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2. Case report

A 40-year-old Chinese woman presented to the hospital with cough and a history of recurrent rash on the skin of the wrist and knee that disappeared spontaneously. As the rash tended to resolve spontaneously, she did not pay attention to it. A CT scan revealed the presence of diffuse ground glass opacity. Her personal and family history did not reveal anything remarkable, and reviews of systems were otherwise unremarkable. Physical examination revealed normal vital signs, no fever, clear lung fields on both sides, and no palpable lymphadenopathy. The results of routine lab investigations, including complete blood count and biochemistry, were normal. The tumor markers that were measured included CEA, NSE, CA125, CA199, and AFP, were in the normal range. HIV testing was negative. The result of the purified protein derivative (PPD) skin test (5 IU) was negative. Blood gas analysis showed that the pH was 7.432; PaO2, 77.1 mm Hg; PaCO2, 38.8 mm Hg; AaDO2, 26.6 mm Hg. A pulmonary function test showed that the VC was 26.7% predicted; the FEV1/FVC was 78% predicted; the FEV1/FVC was 87% predicted; the DLCO was 86% of the predicted value. Lung HRCT showed diffuse fine nodular lesions, ground glass opacity, and minor lymphadenopathy (Fig. 1a and b).
Flexible bronchoscopy and transbronchial biopsy of the lung parenchyma and bronchoalveolar lavage (BAL) were performed. The endoscopic findings did not reveal any endobronchial lesions. Microbiological culture of the bronchial secretion showed no evidence of bacterium, fungus or mycobacterium growth. BAL fluid showed turbid liquid. The pathology report indicated the presence of epithelioid granulomas with no caseous necrosis. The result of the acid-fast bacillus test was negative.

The pathologist could not confirm the diagnosis of intrathoracic sarcoidosis due to the small size of the tissue biopsied using the flexible bronchoscope and lack of clinicoradiologic evidence. Differential diagnoses, including tuberculosis, mold infection, tumor, and other granulomatous diseases, could not be completely excluded. Therefore, thoracoscopy was performed in order to obtain a relatively large tissue mass and histologically confirm the potential disease. Right lateral thoracoscopic was performed, along with wedge resection of the right lower lobe. Intraoperative examination of the resected tissue by the pathologist revealed the presence of epithelioid granulomas. Additional pathologic examination was performed, and numerous epithelioid cell granulomas were also found in all the resected lung fields (Fig. 2).

There was no evidence of tuberculosis, mold infection, tumor, or other granulomatous diseases. Based on the histological findings, the diagnosis was pulmonary sarcoidosis. The patient was discharged 7 days after the operation. As the patient reverted back to her general state of health, 40 mg/d of prednisone was administered orally, and it was recommended that the corticosteroid therapy be continued for 1.5 years with tapering of the dose. HRCT was performed after 6 months; the corticosteroid therapy resulted in significant ablation of the ground glass opacity in the lung (Fig. 3a and b).

3. Discussion

Nodules, interstitial thickening, pulmonary fibrosis and lymphadenopathy are the most common findings among the wide range of abnormalities found on HRCT images of patients with pulmonary sarcoidosis. There are some uncommon findings in HRCT such as unilateral or asymmetric lymphadenopathy, cavitation, necrosis, large opacities, ground glass opacity, reverse halo sign, airway abnormality, and pleural involvement [3–5]. In the case discussed here, the patient presented with predominant ground glass opacity on the lung HRCT scan, which is an atypical finding for sarcoidosis. Ground glass opacity is a nonspecific finding on chest HRCT that is associated with several pulmonary diseases. Ground glass opacity may be a consequence of partial filling up of the alveoli, thickening of the alveolar walls or septal interstitium, or a combination of both. Ground glass opacity on chest HRCT could indicate any of the following diseases: tuberculosis, nonspecific interstitial pneumonia, alveolar hemorrhage, pulmonary alveolar proteinosis, sarcoidosis, etc. [6].

The patient in our case did not have fever, based on which tuberculosis can be excluded. The presence of hilar lymphadenopathies or thickened bronchovascular bundles would indicate sarcoidosis; but HRCT scan in this case showed diffuse ground glass opacity and minor lymphadenopathy, which are not typical for sarcoidosis. Further, in the case of this patient, the fine nodules were distributed in the interstitium and not in the centriflobular airspace; this finding also indicated that the diagnosis was not likely to be tuberculosis. On the basis of all this evidence, we could not exclude lung cancer, especially lepidic predominant invasive adenocarcinoma; nonspecific interstitial pneumonia; alveolar hemorrhage; or pulmonary alveolar proteinosis. Therefore, bronchoscopy or thoracoscopy was also required to reach a diagnosis. The BAL findings were not typical for pulmonary alveolar proteinosis or alveolar hemorrhage. The pathology findings showed that no cancer cells were present. Further, the multifocal epithelioid cell granulomas found were not typical signs of nonspecific interstitial pneumonia. Thus, after exclusion of these diagnoses, sarcoidosis was eventually diagnosed. The findings indicate that ground-glass
opacities observed on lung HRCT scans may represent a number of small granulomas in the interstitium.

4. Conclusion

Predominant ground glass opacity in both lungs is a rare finding in intrathoracic sarcoidosis, as ground glass opacity is a nonspecific sign of lung sarcoidosis. In the absence of clinicoradiologic evidence to support the diagnosis of sarcoidosis, the diagnosis needs to be confirmed based on pathological evidence.

Conflict of interest

The authors declare that they have no competing interests.

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