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Asymptomatic hilar nodules

A case study

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Case study

Mr Lin, a Chinese man aged 38 years, presented for review of a recent chest X-ray. The X-ray was ordered as part of a pre-employment assessment. He was asymptomatic, a nonsmoker and had no significant past medical history. Full blood examination, lipids, glucose and liver and renal function were normal (also ordered as part of the pre-employment assessment). On examination, he looked well, with blood pressure 134/78 mmHg, heart rate 72/min, and chest and cardiovascular examinations normal. His chest X-ray is shown in *Figure 1*.

Question 1

What abnormality is indicated by arrows on the chest X-ray in *Figure 1*?

Question 2

What differential diagnoses could explain this chest X-ray finding? What is the most likely diagnosis?

Question 3

What is an appropriate diagnostic strategy in this patient?

Question 4

What is the management of the likely diagnosis?

Question 5

What is the prognosis of the likely diagnosis?

Answer 1

The arrows point to multiple opacities in the hilar regions of both lung fields. The rest of the lungs are clear.

Answer 2

The bilateral hilar opacities shown *Figure 1* could represent either a hilar lymphadenopathy or pulmonary arterial hypertension (PAH). However, PAH is less likely in this patient who is otherwise well and has clear lung fields and a normal sized heart, as PAH is usually associated with severe obstructive airway disease or congenital heart disease. Hilar lymphadenopathies may be caused by primary or secondary malignancy, inflammation from a granulomatous disease (such as tuberculosis or sarcoidosis) or collagen vascular disease (such as polyarteritis nodosa or mixed connective tissues disease).

While malignant disease must be excluded, it is less likely in an otherwise well patient with symmetric hilar lesions and clear lung fields.



Figure 1. Plain chest X-ray of the patient

Similarly, there are no symptoms or signs suggestive of collagen vascular disease (such as arthralgia, skin lesions or hypertension) and in pulmonary tuberculosis, lung field involvement would be expected. The most likely diagnosis in this patient is sarcoidosis.

Answer 3

After a full history and examination, an appropriate diagnostic strategy in this patient would be to order further imaging with a contrast enhanced computerised tomography (CT) scan and to refer for a diagnostic biopsy (endobronchial, transbronchial or mediastinoscopic). While an elevated serum angiotensin converting enzyme inhibitor (ACEI) is supportive of sarcoidosis, the sensitivity and specificity of this test is not sufficient for it to be considered a diagnostic test. However, serum ACEI is used in the monitoring of established disease. A diagnosis of pulmonary sarcoidosis is made when typical clinical and/or radiological findings are supported by a microscopic finding of noncaseating granulomas, exclusion of other granulomatous disease (such as tuberculosis), and evidence of inflammation in at least two organs.¹

Answer 4

There is a high rate of spontaneous remission of sarcoidosis. For this asymptomatic patient, monitoring with serial chest X-rays and pulmonary function tests is recommended.² However, treatment should be considered for patients with symptoms such as chest pain, isolated cough and dyspnea, worsening pulmonary function tests (FEV₁, FVC, or DLCO <70% of predicted values) or if radiographic features of advanced disease (stage IV or pulmonary hypertension) are noted at 6 months.²⁻⁴

Prednisolone is still the first line and most commonly used drug in sarcoidosis. However there is limited evidence of benefit in stage I and stage IV disease and significant risks associated with long term use.^{5,6}

A typical protocol starts with 20–30 mg of prednisolone daily for 3 months. Patients who show improvement should continue therapy with gradual dose tapering for a total treatment course of 6–12 months.²

Answer 5

Sixty percent of patients with pulmonary sarcoidosis will experience spontaneous remission, with the remaining group of patients running a chronic or progressive course.^{3,7} Overall mortality is 1–5%.^{7,8}

Discussion

Sarcoidosis is a multisystem granulomatous disease of unknown aetiology mainly affecting individuals before the age of 50 years, with peak incidence at 20–40 years and slight female predominance.^{1,8,9} Its incidence varies throughout the world with the highest rate in northern European countries (5–40 cases per 100 000 people).⁹ The incidence in Australia is 4.4–6.3 per 100 000 people.¹⁰

At presentation, more than 90% of patients with sarcoidosis have pulmonary involvement, and more than 40% have other organ involvement.^{1,3} In Australia, the most commonly affected organs include lung (66%), thoracic nodes (58%), skin (22%), eye (18%), and joint (11%).¹⁰ Twenty to 50% are asymptomatic at presentation, 30% have constitutional symptoms and 20–50% have respiratory symptoms.³ Pulmonary sarcoidosis can be classified into four stages (stages I–IV) depending on radiographic findings.⁴ The staging system has prognostic value with a good prognosis in radiographic stage I and II, and a worse prognosis in stages III and IV.¹¹ Oral corticosteroids have probable benefit for patients with stage II and stage III disease with moderate to severe symptoms or progressive changes in symptoms or chest X-ray findings.⁶

Case study follow up

Contrast enhanced CT scan was performed and revealed multiple nodules within the mediastinal and hilar regions with focal vascular encasement (see *Figure 2*, arrowheads). The patient was referred to a tertiary hospital where video-assisted thoracoscopic surgery with wedge lung resection was performed. Histology showed noncaseating granulomas with no evidence of micro-organisms, establishing the diagnosis of pulmonary sarcoidosis.

Postoperatively, the patient's lung function worsened and he was commenced



Figure 2. Transverse view of contrast enhanced chest CT scan demonstrating masses within the mediastinal and hilar regions with vascular encasement (arrowheads)



Figure 3. Plain X-ray taken 2 years later showing a significant reduction in the size of the bilateral hilar masses

on prednisolone, which was continued for 6 months and then tapered. At 2 year follow up the bilateral hilar nodules had reduced in size significantly (*Figure 3*).

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References

1. Judson MA. The diagnosis of sarcoidosis. *Clin Chest Med* 2008;29:415–27.
2. King CS, Kelly W. Treatment of sarcoidosis. *Dis Mon* 2009;55:704–18.
3. Mihailovic-Vucinic V, Jovanovic D. Pulmonary sarcoidosis. *Clin Chest Med* 2008;29:459–73.
4. Statement on sarcoidosis. Joint Statement of the American Thoracic Society (ATS), the European Respiratory Society (ERS) and the World Association of Sarcoidosis and Other Granulomatous Disorders (WASOG) adopted by the ATS Board of Directors and by the ERS Executive Committee, February 1999. *Am J Respir Crit Care Med* 1999;160:736–55.
5. Paramothayan S, Jones PW. Corticosteroid therapy in pulmonary sarcoidosis: a systematic review. *JAMA* 2002;287:1301–7.
6. Paramothayan NS, Lasserson TJ, Jones PW. Corticosteroids for pulmonary sarcoidosis. *Cochrane Database Syst Rev* 2005;CD001114.
7. Nagai S, Handa T, Ito Y, Ohta K, Tamaya M, Izumi T. Outcome of sarcoidosis. *Clin Chest Med* 2008;29:565–74.
8. Sharma OP. Sarcoidosis around the world. *Clin Chest Med* 2008;29:357–63.
9. Lazarus A. Sarcoidosis: epidemiology, etiology, pathogenesis, and genetics. *Dis Mon* 2009;55:649–60.
10. Gillman A, Steinfert C. Sarcoidosis in Australia. *Intern Med J* 2007;37:356–9.
11. Lynch JP, 3rd, Ma YL, Koss MN, White ES. Pulmonary sarcoidosis. *Semin Respir Crit Care Med* 2007;28:53–74.

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