

A 28-year-old female with cough and blood-streaked sputum



Case history

A 28-year-old female was referred to hospital with symptoms of cough and blood-streaked sputum, which had developed over a 7-month period. Her previous clinical history included migraine and arterial hypertension. The patient received antibiotic treatment without improvement. Chest radiography was pathological and symptoms persisted.

On examination, there was no evidence of dyspnoea, finger clubbing, lymphadenopathy or cyanosis. Normal pulmonary and cardiac auscultation was observed. The systemic examination was otherwise normal.

Investigations

The results of a complete blood count and routine biochemical test were normal.

Chest radiography is shown in figure 1.



Figure 1
Chest radiograph.

Task 1

Interpret the chest radiograph.

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Answer 1

Chest radiography revealed an increased density of the right base without obliterating the cardiac silhouette.

A thoracic computed tomography (CT) scan was also carried out (figure 2). In addition, a CT scan with contrast and reconstruction is shown in figure 3.

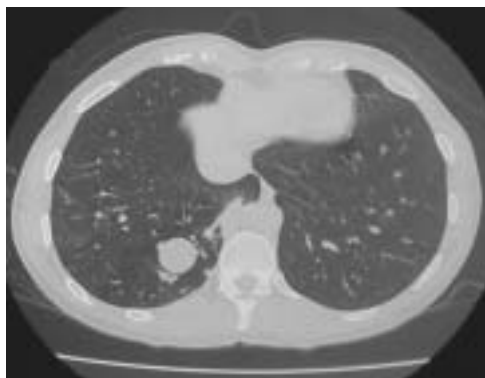


Figure 2
Thoracic CT scan.

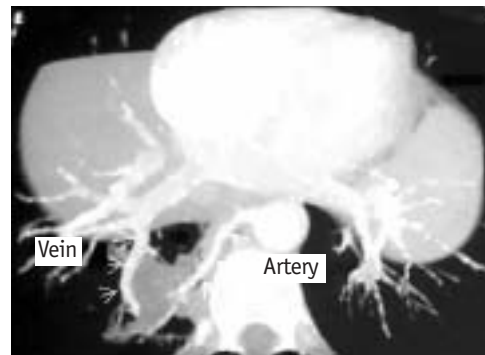


Figure 3
CT scan with contrast and reconstruction.

Task 2

Interpret both of the CT scans.

Answer 2

Figure 2 reveals a cystic image in the base of the right lung surrounded by normal lung tissue.

Figure 3 reveals a lesion with blood supply from the descending aorta and venous return by the lower pulmonary vein.

Fibreoptic bronchoscopy was subsequently performed and the findings were unremarkable. The results from pulmonary function tests also proved normal.

Task 3

Based on the investigation presented to you, suggest a diagnosis.

Task 4

Suggest a treatment option.

Answer 3

The diagnosis was **intralobar pulmonary sequestration**.

Answer 4

Surgical resection was performed.

Clinical course

Surgical access was achieved *via* right muscle-sparing thoracotomy. A hardened pseudonodular zone was found in the right lower lobe, which included segment VI and a large part of the basal segments, as well as an aberrant arterial vessel surrounded by inflammatory-like adenopathies from the descending aorta and venous drainage to the right pulmonary vein, unconnected to the oesophagus (figure 4). Ligation and suture of the aberrant vessel were carried out, followed by lobectomy (figure 5), and subsequent ligation of the vein and artery. The histological specimen showed a cystic lung containing aspergilloma.



Figure 4
Aberrant vessel from the abdominal aorta.

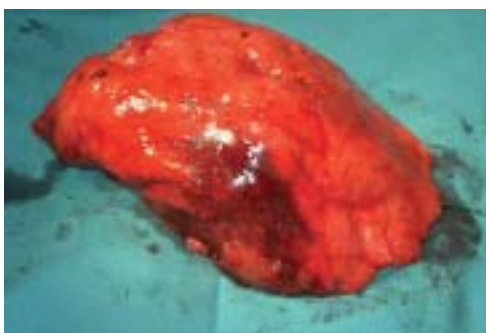


Figure 5
Lower lobe with an ischaemic and indurated region.

The patient is currently asymptomatic, has no respiratory sequelae and leads a normal life.

Discussion

Bronchopulmonary sequestration is a congenital anomaly of lung tissue, accounting for 0.15–6.4% of all congenital pulmonary malformation [1], where normal communication with the tracheobronchial tree is lacking and irrigation is by a systemic artery [2]. The areas most commonly affected are the mid and posterior basal segments of the lower lobes, with the left lung being twice as likely to be affected as the right [3].

Bronchopulmonary sequestration is classified as intra- or extralobar, depending on the pleura that envelops it. Intralobar sequestration is encapsulated by visceral pleura of the affected lobe, whereas the extralobar type is separate from normal lung tissue and encapsulated by its own visceral pleura [3]. Intralobar pulmonary sequestration, although infrequent, is more common than extralobar pulmonary sequestration. A characteristic of both intra- and extralobar sequestration is that blood flow is provided by a systemic artery, usually the abdominal aorta [3]. The association of this pathology with aspergilloma is rare [1].

The most common clinical presentation is chronic cough, sputum and recurrent attacks of pneumonia and haemoptysis [4]. This bronchopulmonary malformation has been associated with various pathologies, including aspergillus, bronco-oesophageal fistula or aortitis associated with severe rheumatoid arthritis [3].

The diagnosis of pulmonary sequestration is based on imaging techniques such as chest CT scan, selective bronchography, pulmonary arteriography or aortography, and pulmonary perfusion scan. Pulmonary sequestration is a rare cause of local perfusion defect. This defect may be explained by the blood supplement from the aorta and not the pulmonary artery, which may be observed during routine chest radiography and CT scan [2].

Currently, the most widely used diagnostic methods include radiological studies of arterial systemic flow. These vessels may arise from the thoracic descending aorta situated below the diaphragm or even from the intercostal arteries or a branch of the renal artery.

Aspergillus is an opportunist fungus, and an aspergilloma develops when the fungus colonises and proliferates in a pre-existing cavity or area of bronchiectasis. In theory, this is because these cavities contain stagnant air or are so poorly ventilated as to predispose to colonisation. Radiological signs of aspergilloma are large

intrapulmonary cavities containing a solid mass. Clinical manifestations may include haemoptysis [5]. Abnormalities that predispose to the development of aspergilloma include bullae, abscesses, carcinoma, bronchiectasis, sarcoidosis and, finally, tuberculous cavities, which constitute the most frequent cause [6].

In haemoptysis, a diagnosis is required to differentiate between haemoptysis, pseudo-haemoptysis and haematemesis, and the amount of blood must be determined. Haemoptysis is defined as the coughing up of blood derived from lungs or bronchial tubes as a result of pulmonary or bronchial haemorrhage. A focused physical examination can lead to the

correct diagnosis in most cases. Chest radiography is often helpful, as well as fiberoptic bronchoscopy and CT. The most common aetiology in children is lower respiratory tract infection and foreign body aspiration, whereas bronchitis, bronchogenic carcinoma and pneumonia are common causes in adults. The goals of management are bleeding cessation, aspiration prevention and treatment of the underlying cause [7].

In conclusion, two infrequent pathologies were found in this patient. Both pulmonary sequestration and aspergilloma result in haemoptysis, which may be life threatening. When both pathologies concur, surgical resection is doubly indicated.

References

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