Unusual association of diseases/symptoms

Lung cancer mimicking massive pulmonary embolism

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Summary

Pulmonary embolism (PE) is a common finding in patients with underlying malignancy and is the commonest cause of acute cor pulmonale. A 65-year-old woman with a background of non-small-cell lung cancer presented to the emergency department with nausea and vomiting after starting erlotinib; she was pyrexial and had raised C-reactive protein. Despite aggressive fluid resuscitation and antibiotics the patient remained tachycardic, hypotensive, profoundly hypoxic and had a persistent raised jugular venous pulse. Massive PE was therefore suspected. A bedside echocardiogram demonstrated a dilated right ventricle and evidence of pulmonary hypertension. A CT pulmonary angiogram excluded a PE but revealed progression of the right hilar tumour causing complete obstruction of the right upper and middle lobe pulmonary arteries. This case highlights an important differential diagnosis when assessing patients with an underlying intrathoracic tumour with findings suggestive of PE and the importance of obtaining further imaging before considering thrombolysis.

BACKGROUND

Pulmonary embolism (PE) is a common finding in patients with underlying malignancy¹ and is the commonest cause of acute cor pulmonale. In this case, an obstructing tumour mimicked a massive PE by causing obstruction of the pulmonary arteries, leading to hypoxia, pulmonary hypertension and acute right heart failure. It is therefore particularly important to obtain further imaging before considering thrombolysis.

CASE PRESENTATION

A 65-year-old woman presented to the emergency department with nausea and vomiting after starting erlotinib as second-line treatment for non-small-cell lung cancer (T4N3Mx). She had previously received chemotherapy and radiotherapy. She also had a background of chronic obstructive pulmonary disease. On examination, oxygen saturations were 80% on air, she was febrile at 39.5°C, tachycardic at 139 bpm and had a low normal blood pressure of 104/75 mm Hg. Electrocardiogram showed sinus tachycardia. Antero-posterior chest radiograph revealed right middle lobe volume loss consistent with collapse that was similar to previous radiographs, but there was no focus of infection. Blood tests revealed significantly raised C-reactive protein of 302 mg/l. She was initially thought to be dehydrated as well as having a lower respiratory tract infection. She was commenced on intravenous antibiotics and fluids.

The day following admission, she remained tachycardic and hypotensive despite aggressive fluid resuscitation. She was found to have a persistently raised jugular venous pulse. She became increasingly hypoxic; an arterial blood gas revealed a pO₂ of 7 kPa (on room air). A massive PE was suspected.

INVESTIGATIONS

An urgent bedside echocardiogram (video 1) confirmed a severely dilated right ventricle (3.9 cm basal diameter;

figure 1) with evidence of mild pulmonary hypertension with an estimated pulmonary artery pressure of 43 mm Hg (TR jet 2.4 m/s). However, there was no intracardiac thrombus visible. An echocardiogram 6 months before this presentation demonstrated dimensions within normal limits and only physiological tricuspid regurgitation.

The patient subsequently underwent CT pulmonary angiogram (figure 2), which excluded the presence of a PE but confirmed progression of the right hilar tumour, causing complete obstruction of the right upper and middle lobe pulmonary arteries and obstruction of the right upper pulmonary vein, as well as complete obstruction of the right middle lobe bronchus.

DIFFERENTIAL DIAGNOSIS

A patient with a history of advanced malignancy presenting with tachycardia, hypotension and hypoxia may be severely septic in the context of pyrexia and immune compromise, but may well have a PE or an obstructing

Figure 1 Apical four-chamber view during bedside echo; 3.9 cm basal diameter of dilated right ventricle.

Figure 2 Apical four-chamber view during bedside echo; 3.9 cm basal diameter of dilated right ventricle.

lesion, as in this case. Given that venous thromboembolism occurs in up to 11% of patients with cancer,¹ this must be considered as a differential diagnosis. Whereas the initial management of this patient was appropriate in view of pyrexia and markedly raised inflammatory markers, she failed to respond appropriately to intravenous antibiotics and fluids, raising the question of either another diagnosis or dual pathology. Further investigations were particularly important to exclude PE as a potential reversible cause of the patient's deterioration.

OUTCOME AND FOLLOW-UP

The patient continued to rapidly deteriorate with type I respiratory failure and right ventricular dysfunction. Given that the cause was a malignant lesion causing obstruction that was unfortunately not amenable to stenting, and that the patient's disease had continued to

progress despite previous oncological intervention, it was decided to withdraw active treatment and turn the focus to alleviating the patient's symptoms.

DISCUSSION

Whether obstruction of a pulmonary artery is the result of massive PE or locally advanced malignancy, the consequences are identical: acute right ventricular dysfunction and hypoxia. Similar cases have been described² and in another case report a bronchogenic cyst caused comparable symptoms.³ Other causes include mediastinal lymphadenopathy due to lymphoma,⁴ germ cell tumours⁵ or thymoma.⁶ This case highlights an important differential diagnosis when assessing patients with an underlying intrathoracic tumour with findings suggestive of PE.

Learning points

- ▶ Transthoracic echocardiography is important in the assessment of a persistently tachycardic, hypotensive and hypoxic patient with evidence of right ventricular dysfunction.
- ▶ However, if the patient is not an extremis, this should not replace definitive imaging modalities such as CT pulmonary angiogram if no thrombus is identified on echocardiography, as other, rarer causes can lead to a similar presentation.
- ▶ Conversely, the British Thoracic Society guidelines advocate treatment with thrombolysis on clinical grounds alone if cardiac arrest is imminent⁷.

Competing interests None.

Patient consent Obtained.

Video 1 Apical four-chamber view; hyperdynamic myocardium, dilated RV.

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