CASE REPORT

An unusual and deadly cause for massive haemoptysis

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SUMMARY

We report a 47-year-old man with diabetics presenting with massive haemoptysis. Physical examination showed moderate pallor, but was otherwise normal. Evaluation showed normal bleeding and clotting parameters. Aerobic cultures of sputum samples and acid-fast staining were negative. CT showed fusiform aneurysmal dilation of the descending thoracic aorta compressing the left main bronchus with secondary collapse of the left lower and lingular lobes. Massive haemoptysis was attributed to probable erosion of the aneurysm into the left main bronchus. Retrospective questioning failed to elicit pathognomic symptoms of aortic aneurysm including chest pain. While in the hospital, the patient had another bout of massive haemoptysis, requiring endotracheal intubation for airway protection. Chest x-ray revealed homogeneous opacification of the left hemithorax. The patient was treated with antitussives and blood transfusions and referred to a higher centre for endovascular stent grafting of the aneurysm and simultaneous surgical repair of the left main bronchus. Aortic aneurysm is a rare but deadly cause for haemoptysis, as rapid exsanguination can lead to cardiovascular collapse and death.

BACKGROUND

Massive haemoptysis has been defined as expectoration of blood exceeding 600 ml over a period of 24 h.¹ It is a life-threatening phenomenon and can rapidly lead to death through asphyxiation or cardiovascular collapse. Although only 5% of all cases of haemoptysis are massive, studies have reported a death rate of up to 80% in patients with massive haemoptysis, emphasising the grave prognosis of this condition.² The aetiology of massive haemoptysis is identical to that for all forms of haemoptysis, and includes pulmonary parenchymal and airway disease, vascular disorders, vasculitides, coagulopathy and bleeding diatheses. Of these causes, cavitary tuberculosis, bronchiectasis and lung abscess alone are responsible for most cases of massive haemoptysis.³ Although uncommon, vascular aetiologies including pulmonary embolism, vascular malformations, mitral stenosis and right-sided endocarditis with septic pulmonary emboli should be recognised and treated early, since they can produce torrential bleeding and may also be associated with compromised cardiac function. Aortic aneurysms with erosion into adjacent bronchi share these features and require immediate surgical repair. This case report highlights an atypical presentation of aortic aneurysm and the need to maintain a high index of suspicion for this condition, especially in patients with risk factors for atherosclerosis.

CASE PRESENTATION

A 47-year-old Asian-Indian man presented with recurrent episodes of haemoptysis since the past 3 days, including one episode of massive haemoptysis with expectoration of approximately 800 ml of blood. He denied any associated symptoms of chest pain, fever or breathlessness. He had recently been diagnosed with diabetes mellitus and was receiving oral antidiabetic drugs at the time of presentation. The patient also denied any history of substance abuse. Chest x-ray performed at a local hospital had demonstrated mediastinal widening and the patient had been referred to us for further evaluation.

General physical examination showed moderate pallor. He was haemodynamically stable with a blood pressure of 140/86 mm Hg and no postural drop. Cardiac and respiratory examination was essentially normal.

INVESTIGATIONS

Routine laboratory tests confirmed the presence of anaemia (haemoglobin 8.4 g/dl). Bleeding and clotting parameters were within normal limits (platelet count $160 \times 10^9/l$; bleeding time 4 min 30 s; clotting time 6 min; prothrombin time 15.1 s, international normalised ratio 1.04; activated partial thromboplastin time: 29.1 s, control 32.2 s). Glycaemic control appeared reasonable (glycated haemoglobin (HbA1c) 7.6%). Sputum smears were persistently negative for acid-fast bacilli by Ziehl-Neelsen technique. Sputum culture grew out of normal oropharyngeal flora.

Thoracic CT revealed fusiform aneurysmal dilation of the distal portion of the arch of the aorta and the descending thoracic aorta with a maximum internal diameter of 8 cm (figures 1–3). The

Figure 1 Contrast-enhanced thoracic CT (axial section) showing aneurysmal dilation of the descending thoracic aorta.

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Figure 2 Contrast-enhanced thoracic CT (coronal section) showing fusiform aneurysmal dilation of the descending thoracic aorta.

aneurysm was seen to compress the left main bronchus with secondary collapse of the left lower and lingular lobes. There was no contrast extravasation or defect in the wall of the aneurysm. An eccentric atherosclerotic plaque measuring 1.6 cm in thickness was also noted in the wall of the descending thoracic aorta aneurysm.

DIFFERENTIAL DIAGNOSIS

Massive haemoptysis due to aortic aneurysm with erosion into the left main bronchus; secondary collapse of the left lower and lingular lobes.

TREATMENT

The patient was treated symptomatically with cough suppressants; two units of packed red cells were also transfused.

OUTCOME AND FOLLOW-UP

Despite the above measures, the patient suffered another bout of massive haemoptysis while in hospital, necessitating endotracheal intubation for airway protection. Chest x-ray performed after this event showed a homogeneous opacity occupying the entire left hemithorax (figure 4), probably reflecting massive

Figure 3 CT with volume rendered three-dimensional reconstruction of the thoracic aortic aneurysm compressing the left main bronchus.

Figure 4 Chest x-ray (posteroanterior view) performed after recurrent massive haemoptysis showing homogeneous opacity occupying the entire left hemithorax.

haemorrhage and aspiration. The patient was therefore immediately referred to a higher centre for endovascular stent grafting of the aneurysm and simultaneous surgical repair of the left main bronchus. He was subsequently lost to follow-up.

DISCUSSION

Aneurysmal dilation of the thoracic aorta is defined as a localised region with a diameter 50% greater than expected, lined by intima, media and adventitia.⁴ Thoracic aneurysms are further classified by the Crawford system,⁵ wherein the aneurysm seen here would be categorised as extent I. The majority of these aneurysms are associated with atherosclerotic disease of the aorta,⁶ as was seen in our case. Therefore, the risk factors for the development of aortic aneurysms correspond to risk factors for atherosclerosis.

Aortic aneurysms are often clinically silent and incidentally diagnosed. Occasionally, these aneurysms can present with symptoms attributable to aortic regurgitation due to associated aortic root dilation. Aortic aneurysms can also manifest with pressure symptoms including hoarseness due to recurrent laryngeal nerve compression, dysphagia due to oesophageal compression and superior vena cava syndrome, or ischaemic complications due to compromise of arteries arising directly from the affected segment of the aorta. Localised back and chest pain resulting from the erosion of surrounding tissue is an important, if overlooked, symptom.

Erosion into an adjacent hollow viscus can rarely occur with expanding aortic aneurysms. Oesophageal involvement produces haematemesis while erosion into a bronchus results in haemoptysis, as was seen in this instance. Rupture of a thoracic aortic aneurysm, whether directly into the mediastinum or into a hollow viscus, can be catastrophic, leading to massive blood loss and cardiovascular collapse.⁷ Moreover, emergent surgical repair in this situation carries a dismal prognosis; one study showed a 30-day death rate of up to 42% in such cases.⁸ Conversely, the development of improved surgical techniques has resulted in significantly lower morbidity and mortality for patients undergoing elective stenting of the aortic aneurysm.⁹

Early diagnosis and timely treatment is therefore essential in patients with suspected aortic aneurysm. Transthoracic echocardiography is helpful as a non-invasive screening tool while contrast-enhanced CT provides accurate delineation of the size

and extent of aneurysmal dilation, making it the investigation of choice.

This case report highlights an unusual manifestation of a thoracic aortic aneurysm. Rapid diagnosis in this instance permitted early referral for endovascular stenting and bronchial repair. Keeping in mind the disastrous consequences of aneurysmal rupture, it is essential to maintain a high index of suspicion for aortic aneurysm in all patients with unexplained haemoptysis with risk factors for atherosclerosis.

Learning points

- ▶ Thoracic aortic aneurysms can erode into adjacent bronchi, producing massive haemoptysis.
- ▶ Aggressive evaluation including thoracic CT should be pursued to rule out this condition, especially in the absence of other symptoms of parenchymal lung disease.
- ▶ A classical presentation with chest pain and/or pressure symptoms may be absent in patients with aortic aneurysms and cannot be relied upon to rule out this condition.

Competing interests None.

Patient consent Obtained.

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