CASE REPORT

A ruptured bronchial artery aneurysm with massive haemoptysis

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SUMMARY

Massive haemoptysis is associated with high mortality. Among various diseases presenting with massive haemoptysis, a ruptured bronchial artery aneurysm (BAA) is a rare entity. We report the case of a ruptured BAA as small as 3 mm in diameter associated with massive haemoptysis in a previously healthy 77-year-old woman. She had suddenly developed massive haemoptysis and was intubated and admitted to the intensive care unit. A CT scan and repeated bronchoscopy could not reveal the cause. Because haemorrhage continued, she underwent bronchial arteriography (BAG) twice. We finally detected a BAA with a bleb that led to the diagnosis of a ruptured BAA only 3 mm in diameter. After bronchial artery embolisation, the haemoptysis ceased. Although rare, a ruptured BAA should be considered as a cause of massive haemoptysis. Because a small BAA may get overlooked, close observation is important in BAG.

BACKGROUND

When a patient presents with massive haemoptysis, it is important to identify the cause of bleeding. A massive haemoptysis is often caused by tuberculosis, bronchiectasis or lung infection,^{1,2} but a ruptured bronchial artery aneurysm (BAA) is an uncommon aetiology. We report the case of a ruptured BAA as small as 3 mm in diameter associated with haemoptysis.

CASE PRESENTATION

A 77-year-old woman was presented with haemoptysis at our emergency department. The patient was an ex-smoker, had no previous medical history and was not on any medication. This was her first episode of haemoptysis. Her vital signs were as follows: heart rate, 111 beats per minute; blood pressure, 97/74 mm Hg; respiratory rate, 30 breaths/min; oxygen saturation, 92% (room air) and temperature, 36.3°C.

INVESTIGATIONS

On physical examination, auscultation revealed decreased breath sounds in the right base and fine crackles bilaterally. Laboratory data showed no abnormal findings, including coagulopathy. The chest X-ray and CT showed no consolidation or bronchial dilation (figure 1).

TREATMENT

During her stay in the emergency department, massive haemoptysis occurred, and oxygen

saturation rapidly dropped to below 80%. The patient was immediately intubated and admitted to the intensive care unit. Bronchoscopy could not identify the cause of haemoptysis. Because high positive end-expiratory pressure and administration of blood products did not decrease the haemoptysis, bronchial arteriography (BAG) was performed twice. At the first session on the third day of hospitalisation, we could not find the bleeding source. On the fourth day of hospitalisation, bronchoscopy revealed bleeding from the left upper bronchus. At the second BAG session, we detected a small aneurysm with a bleb at the left superior bronchial artery, which was consistent with the bronchoscopic finding (figure 2). The patient was diagnosed with a ruptured BAA.

OUTCOME AND FOLLOW-UP

After BAA embolisation with N-butyl-2-cyanoacrylate (figure 3), the haemoptysis ceased. On the eighth day of hospitalisation, she was extubated, and on the 37th day, she was transferred to a rehabilitation hospital. During the next 7 months, she experienced no recurrence.

DISCUSSION

This case suggested two clinical issues. A ruptured BAA can cause massive haemoptysis and a BAA as small as 3 mm in diameter may get overlooked.

First, among various causes of massive haemoptysis, such as bronchiectasis, tuberculosis, lung cancer and lung infection,^{1,3,4} a ruptured BAA is an uncommon entity. However, it is important to identify a ruptured BAA because it can successfully be diagnosed and treated using bronchial artery embolisation (BAE).

The clinical presentation of a ruptured BAA is varied depending on the anatomical location of the aneurysm, intrapulmonary or mediastinal. While a ruptured intrapulmonary BAA mainly presents as haemoptysis, a ruptured mediastinal BAA presents as chest pain, back pain, epigastric pain, shock, haematemesis.⁵⁻⁷

Management of massive haemoptysis comprises several steps. After initial resuscitation involving establishing a patent airway and adequate gas exchange, the next step is controlling the bleeding. Although a surgical intervention should always be considered, arteriographic embolisation has been generally employed because of its less invasive and more effective nature.² Particularly, BAA is a good indicator of endovascular treatment.⁸

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Figure 1 Chest CT scan on admission.

In this case, no coagulopathy was observed. CT scan on admission showed no signs of bronchiectasis, tuberculosis, lung cancer or lung infection. Bronchoscopy on admission did not reveal the source of bleeding either. Although for the first several days we could not make a definite diagnosis, the haemoptysis was persistent. In this difficult situation, BAG proved to be an important approach in two aspects. BAG not only identified the cause of the haemoptysis but also assisted radiologists in performing therapeutic embolisation. Considering that a ruptured BAA is a life-threatening condition and that our case had no recurrent bleeding after BAE, a ruptured BAA is a rare but important aetiology of massive haemoptysis, and BAG is helpful both in diagnosis and treatment.

The second important clinical issue is that a BAA as small as 3 mm in diameter may get overlooked. In this case, the diameter of BAA (3 mm) was much smaller than the previously reported mean diameter of 29.3 mm for ruptured BAAs.⁵ At the first session of BAG, BAA was regarded as torsion of the bronchial artery because of its small size. At the second session, we closely observed the left upper bronchial artery based on the bronchoscopic findings obtained just before BAG and finally detected the small BAA. BAG was critically important for the diagnosis and treatment of this ruptured BAA; thus, clinicians should pay close attention to the details of BAG.

In conclusion, a ruptured BAA can cause massive haemoptysis. Because BAA can be diagnosed and treated using BAG, clinicians should consider BAG when CT scan or bronchoscopy does not

Figure 2 Bronchial arteriography on the fourth day of hospitalisation showing a bronchial artery aneurysm with a bleb.

Figure 3 After bronchial artery embolisation with *N*-butyl-2-cyanoacrylate.

reveal the cause of haemoptysis, especially if the haemoptysis is persistent. Because a BAA as small as 3 mm in diameter may get overlooked, close observation is necessary in BAG.

Learning points

- ▶ A ruptured bronchial artery aneurysm (BAA) is a rare but important cause of massive haemoptysis.
- ▶ Bronchial arteriography is useful not only in the diagnosis but also in the treatment of a ruptured BAA.
- ▶ A small BAA may get overlooked.

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