Aortobronchial fistula: an uncommon cause of haemoptysis

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Summary: A 16 year old patient who presented with haemoptysis as the main manifestation of the infection of an aortic patch graft is reported. The importance of being alert about the possibility of an aortobronchial fistula in patients with haemoptysis who have been previously subjected to cardiovascular surgery is emphasized.

Introduction

Leaking of blood from the aorta into the lungs due to an aortobronchial fistula (ABF) is an uncommon cause of haemoptysis. Clinicians need to be aware of the possibility because delay in diagnosis may contribute to a fatal outcome, mortality being greater than 50%.¹ We therefore report a patient who presented with haemoptysis as the first symptom of an infected aortic patch following repair of a coarctation.

Case report

A 16 year old girl was admitted to the hospital because of haemoptysis. Sixteen months before, she had undergone patch aortoplasty for repair of a coarctation of the aorta. Physical examination and chest X-ray performed one year after surgery during routine follow-up had been normal. Two weeks before admission, she suffered a dental infection that apparently resolved with amoxycillin. Five days before admission, cough, small amounts of blood-streaked sputum and mild discomfort at the level of the surgical scar appeared.

The temperature was 37.5°C, the pulse rate was 90/min, and the blood pressure 110/60 mmHg. A soft ejection-type murmur was heard over the left sternal border. Some rales were present over the lower part of both lungs. The abdomen, the extremities, and the optic fundus were normal.

The haemoglobin was 12 g/dl and the white cell count was 21.3 × 10⁹/l, with 78% neutrophils. The platelet count and the coagulation tests were normal. An X-ray film of the chest showed a soft shadow in the left upper lobe, adjacent to the aortic arch (Figure 1). A Gram stain of sputum showed numerous leucocytes and Gram-positive cocci; the Ziehl stain disclosed no acid-alcohol resistant bacilli. Treatment with amoxycillin was begun.

On the following day, she had haemoptysis of about 200 ml of blood. A bronchoscopic examination demonstrated bleeding from the bronchus of the left upper lobe. An aortobronchial fistula was suspected, and then confirmed by computed tomographic scan showing the leaking of injected contrast into the lung. She was taken to surgery and a left thoracotomy was performed. At operation, a dehiscence of the suture was found, with bloody fluid around the graft and extending into the adjacent upper lobe of the left lung. Since the surgical approach did not allow an extra-anatomical bypass at that moment, it was decided to

Figure 1 Chest X-ray taken on admission, showing a soft shadow in the left upper lobe.

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Accepted: 8 September 1988

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resect the affected zone and to insert an end-to-end Dacron tube graft, delaying the bypass until a further operation. Broad-spectrum antibiotic treatment was given. Sputum and blood cultures were negative. A Gram-positive anaerobic rod, that unfortunately could not be identified, was isolated from the removed patch. The antibiotics were changed according to sensitivity tests, but the course was complicated by an overwhelming pneumonia and the patient died on the eleventh day of admission.

**Discussion**

This case report represents an uncommon but important cause of haemoptysis, that has received little attention in non-surgical literature. Nevertheless, ABF may develop as a complication of an aneurysm of the aorta, whether atherosclerotic, syphilitic or dissecting, or even in association with tuberculous aortitis. More often it complicates surgical procedures, such as valve replacement, aortocoronary bypass, interruption of persistent ductus arteriosus and reconstructive procedures of the aorta when it may arise from a true or false aneurysm.

Aneurysms are particularly common after patch aortoplasty for repair of coarctation. The compliance mismatch between the rigid graft and the more elastic aorta seems to be implicated in the development of true aneurysms. Dehiscence of the suture, commonly associated with infection, is the origin of false aneurysms.

Infection of the aortic patches usually occurs in the first year after surgery, staphylococci being the most commonly isolated pathogens. Pathogenetic mechanisms that can result in patch infection include direct microbial contamination at the time of surgery, extension of infection to the graft from an adjacent tissue site, and bacteraemia. As in cases of early prosthetic valve endocarditis, most patch infections in the first two months after surgery probably result from direct contamination of the graft at operation. The pathogenetic mechanism was not elucidated in the present case. Nevertheless, the long time since coarctation repair and the lack of evident infection in the tissues contiguous to the aorta suggest bacteraemia as the most likely cause of patch infection. So often in endovascular infections, the origin of the bacteraemia was not clear. However, it could be related to the recent past odontogenic infection. Although Gram-positive cocci and bacilli are the predominant microorganisms in the oral cavity, *Bacteroides* and other anaerobic Gram-negative rods are frequently isolated from the gingival crevice, particularly in the presence of periodontal disease.

The time course of the process is also compatible with that mechanism, as indicated by studies of other endovascular infections.

In any patient with haemoptysis who had previously undergone cardiac surgery, and particularly in the case of a patch aortoplasty, the possibility of an aortobronchial fistula should be carefully considered. Aortography has been frequently employed to confirm the diagnosis, but the contrast-enhanced computed tomographic scan represents a convenient alternative. In a patient of this kind, if the cause of the haemoptysis is not obvious, a computed tomographic scan of the thorax should be obtained early in the diagnostic work-up.

**References**


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doi: 10.1136/pgmj.65.761.171

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