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LOOK PAST THE BLEED! A CASE OF NON-TRAUMATIC THORACIC AORTIC PSEUDOANEURYSM PRESENTING AS HAEMOPTYSIS

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ABSTRACT

Introduction: Aortic pseudoaneurysms are a type of contained rupture where most of the aortic wall is breached, leaving only a thin rim of the remaining wall or adventitia to hold the blood. This condition carries a high risk of rupture and potentially fatal complications. Typically, patients present with chest pain; haemoptysis can also occur, though rarely.

Case description: A 64-year-old male who presented with two episodes of haemoptysis, with no history of cardiovascular surgery or trauma. A chest computerized tomography (CT) followed by an aortogram revealed a thoracic aortic pseudoaneurysm and the patient underwent surgical aortic repair without any complications. This case underscores the rare presentation of thoracic aortic pseudoaneurysm.

Discussion: Haemoptysis is a rare manifestation of thoracic aorta pseudoaneurysm and can be a warning sign of impending rupture. Haemoptysis may occur due to formation of aortopulmonary fistula or direct erosion of pseudoaneurysm into lung parenchyma.

Conclusion: It is imperative for clinicians to recognise such manifestations early for prompt diagnosis and prevention of complications.

KEYWORDS

Haemoptysis, pseudoaneurysm, aorta, atherosclerosis, cardiovascular surgery

LEARNING POINTS

- Recognise haemoptysis as the manifestation of thoracic aortic pseudoaneurysm.
- Early diagnosis and treatment are crucial due to high rate of complications and mortality.
- Trauma and cardiovascular surgery are the most common cause for thoracic aortic pseudoaneurysm; however, sometimes it can occur due to atherosclerosis.

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INTRODUCTION

Thoracic aortic pseudoaneurysms are relatively rare but can have life-threatening consequences if not diagnosed and managed promptly. Aortic pseudoaneurysms are a contained rupture of the aorta in which most of the aortic wall has been breached, and luminal blood is held in only by a thin rim of the remaining wall or adventitia. They usually occur due to trauma or previous cardiothoracic interventions. Although they usually present with chest pain, they can also, rarely, present with haemoptysis. We present one such case of thoracic aortic pseudoaneurysm presenting with haemoptysis.

CASE DESCRIPTION

A 64-year-old male with a history of rheumatoid arthritis and hypertension presented to the emergency department with two days of non-productive cough and two episodes of haemoptysis. He did not report any fever, chest pain or shortness of breath. He was not on any blood thinner and never had any bleeding problems in the past. The patient denied previous cardiovascular surgeries or any chest trauma. He did not have any risk factors for tuberculosis and denied any drug use.

Haemoptysis was about 100 ml (about 3.38 oz) over 24 hours and was associated with clots; the last episode had been an hour previously, at home. The patient was haemodynamically stable in the emergency department, with blood pressure of 110/98 mmHg, heart rate 78 beats per minute, oxygen saturation 98% on room air and he was afebrile. On examination he had normal heart sounds, no jugular vein distention and had regular pulses; his chest was clear, and his lips showed dried blood.

Blood work was unremarkable. Initial laboratory tests showed haemoglobin 13.1 g/dl; platelet count 200,000/µl, white blood cells 8000/µl, creatinine 0.9 mg/dl, international normalised ratio < 1 second, partial thromboplastin time 30 seconds; lactic acid and hepatic function tests were within normal limits. A QuantiFERON tuberculosis (TB) (interferon gamma release assay) was performed, which was negative. An electrocardiogram (EKG) showed normal sinus rhythm and a chest X-ray was unremarkable. A chest CT with contrast revealed disruption of calcifications along the aortic arch with small contrast-filled outpouching, with an underlying thrombus and adjacent mild collapse/atelectasis of the lung. These findings were concerning for a pseudoaneurysm. Following this, a CT aortogram was performed, which showed disruption of calcifications with a penetrating ulcer and associated partially thrombosed pseudoaneurysm of the aortic arch, as shown in *Fig. 1*.

It also showed adjacent subsegmental collapse in the left upper lung along the pseudoaneurysm, in close abutment with pulmonary vessels. The cardiothoracic team was immediately consulted, and the patient underwent a distal aortic arch and proximal descending thoracic aortic repair. The patient had no further episodes of haemoptysis and was discharged home after a few days.

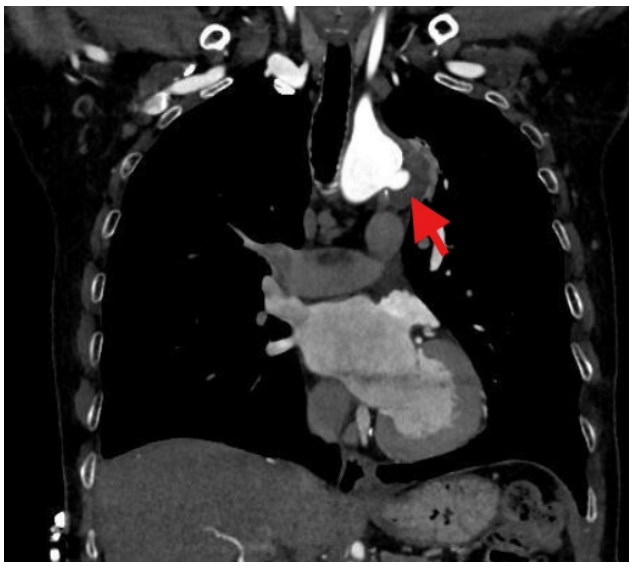

Figure 1. CT aortogram showing disruption of calcifications with a penetrating ulcer and associated partially thrombosed pseudoaneurysm of the aortic arch (arrow).

DISCUSSION

Pseudoaneurysms, also known as false aneurysms, develop at the site of arterial injury caused by trauma or infection. Unlike true aneurysms, where the blood vessel wall balloons out, pseudoaneurysms do not involve the vascular wall. Instead, blood leaks from the injury site and is contained by a wall formed from clotting products[1]. Common sites for pseudoaneurysms include the cardiac, femoral, visceral and aortic vasculature[1]. Aortic pseudoaneurysms are rare and seldom occur spontaneously[2]. The common causes of pseudoaneurysm formation include atherosclerosis, infections, connective tissue disorders and trauma[2]. They can also appear following thoracic surgeries such as aortic valve replacements, aortic dissection repairs and coronary artery bypass grafting[2]. Most pseudoaneurysms are associated with aortic valve or coronary artery bypass graft surgeries[1]. Some studies have documented an incidence rate of up to 7.7% in patients following aortic procedures[3]. Aortic pseudoaneurysms are potentially fatal and may result in death in 32% to 40% of cases if they rupture[4].

Patients typically present with symptoms such as chest pain, heart failure or sepsis if the pseudoaneurysm is infected[3]. Aortic pseudoaneurysms can sometimes also be asymptomatic[4]. Haemoptysis is a rare yet significant sign of thoracic aortic pseudoaneurysm and this symptom can be a warning sign, indicating impending rupture of pseudoaneurysm. Haemoptysis in the context of a thoracic aortic pseudoaneurysm can result from several mechanisms. One possible cause is the formation of an aortopulmonary fistula, an abnormal connection between the aorta and the pulmonary artery or veins. Another potential cause is the direct erosion of the pseudoaneurysm into the lung parenchyma, leading to bleeding[5].

Recognising haemoptysis as a symptom of thoracic aortic pseudoaneurysm is crucial for timely diagnosis and intervention. If left untreated, this condition can lead to life-

threatening complications, including massive bleeding and rupture of the aneurysm. Therefore, any haemoptysis in a patient with risk factors for thoracic aortic pseudoaneurysm should prompt immediate medical evaluation to determine the underlying cause and initiate appropriate treatment. Early detection and management are essential to improve outcomes and prevent fatal complications.

Computerised tomography angiograms or conventional arteriography are commonly used to diagnose aortic pseudoaneurysms[1], which are considered grade III aortic injuries. They are now typically treated with thoracic endovascular aortic repair or endovascular aneurysm repair, due to their lower risk of complications compared to open surgery[1]. Endovascular treatment is a safe, durable and less invasive alternative[4].

In our patient, there was no history of cardiac or vascular surgeries and no signs of infection. We believe his hypertension and atherosclerosis likely contributed to the formation of a pseudoaneurysm. His presentation with haemoptysis, an infrequent symptom of aortic pseudoaneurysm, underscores the importance of this case. Given the high mortality associated with this condition, it is crucial to recognise such manifestations early for prompt diagnosis and prevention of complications.

CONCLUSION

Thoracic aortic pseudoaneurysms are an uncommon cause of haemoptysis. A high index of suspicion and awareness is needed to recognise this presentation, even in patients with no history of trauma and cardiovascular interventions but with risk factors for atherosclerosis, as it can be life-threatening.

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