Case report

Aorto-bronchial fistula following aortic and bronchial stenting of a thoracic aneurysm

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Abstract

A 66-year-old man underwent repair of an abdominal aortic aneurysm and synchronous stenting of a thoracic aneurysm compressing his left main bronchus. This resulted in further bronchial compression which was also stented. An aorto-bronchial fistula resulting in severe haemoptysis occurred a few weeks later. This was successfully treated with repeat endovascular stenting and left pneumonectomy. Open repair should be the treatment of choice for thoracic aneurysms with bronchial compression.

Keywords: Aortic aneurysm; Aortic stent; Airway stent

1. Introduction

Thoracic aneurysms can cause bronchial compression or even rupture into the left main bronchus [1]. Endoluminal stent graft repair is being employed increasingly as an alternative to open repair for the treatment of both thoracic aneurysms and their complication of aorto-bronchial fistulas [2]. To our knowledge, the impact of stenting in cases where the aneurysm is compressing the left main bronchus has not been described previously.

2. Case report

A 66-year-old man was found to have thoracic and abdominal aortic aneurysms following investigations for a non-productive cough. He underwent elective open repair of his abdominal aortic aneurysm and synchronous endovascular stenting of his thoracic aneurysm via the abdominal aorta. Pre-operative CT scan (Fig. 1) showed compression of his left main bronchus.

On the day following surgery after extubation, he developed respiratory difficulties and required re-intubation. Repeat CT scan showed complete occlusion of the left main bronchus by the aneurysmal sac. The endovascular stent was well positioned with total exclusion of the aneurysm. Reventilation of the left lung was established by inserting two overlapping Gianturco self-expanding uncovered metallic stents into the left main bronchus. The remainder of his hospital course was uneventful.

Four weeks after discharge he was re-admitted with a left-sided empyema, culture of which revealed methicillin-resistant Staphylococcus aureus. Bronchoscopy revealed a 7 mm defect in the distal membranous portion of the left main bronchus. One of the bronchial stents had migrated outside the bronchus and the other was more distally placed in the upper and lower lobar bronchi. The external aspect of the aortic stent was visualized through the bronchial defect. A further CT scan showed air around the aortic stent graft (Fig. 2). Initially there was no bleeding from the fistula.

Because of his poor general condition he was managed with pleural drains and antibiotics, but 3 days later he developed massive haemoptysis resulting in cardiopulmonary arrest. He was successfully resuscitated, with spontaneous cessation of bleeding. Emergency contrast CT showed no extravasation of contrast from the aorta, and bronchoscopy showed no active bleeding. Given the dramatic nature and the volume of blood lost, it was assumed to have originated from a major leak from the stent/graft. Possible sites of a leak were the proximal and distal seal zones, the overlap zone between the two stents used for the primary repair and perforation of the fabric by one of the Gianturco stents. An emergency procedure was undertaken to reline the original stent/graft with additional stent/graft to include extension of the proximal sealing zone.

His condition stabilized with no further bleeding and he was discharged home, with continued intravenous antibiotic therapy. Two months later, a repeat bronchoscopy showed an
increase in the size of the aorto-bronchial fistula confirmed at left thoracotomy. A number of bronchial stent wires had migrated into the cloth of the endoluminal aortic stent. Because of destruction by the stents of the lobar bronchi serving the left lung, removal of the bronchial stent and repair of the bronchi were not feasible so left pneumonectomy was carried out. The descending aorta was debrided and two suction drains were placed close to the aortic graft. A latissimus dorsi muscle flap was used to cover this area separating it from the remainder of the pneumonectomy space and the left main bronchial staple line.

He remains well 9 months after surgery but continues on long-term oral antibiotics.

3. Discussion

The use of stents to relieve severe tracheal or bronchial compression caused by aortic aneurysm has been reported previously [3,4], although the long-term outcome is unclear. One Palmaz stent inserted into a patient with tracheobronchial compression caused by a thoracic aortic aneurysm became deformed by extrinsic compression and was not thought to be the optimal type to use [5]. In another case, a self-expanding Nitinol stent relieved left main bronchial compression caused by a descending aortic dissection but resulted in fatal aorto-bronchial fistula 20 days after implantation [6].

Endoluminal stent graft repair is being employed with increasing frequency for treatment of thoracic aortic aneurysms, traumatic dissection and aorto-bronchial fistulas. To our knowledge, there have been no previous reports on the effect of this procedure upon bronchial compression resulting from an aneurysm.

In our case, the left main bronchus was compressed on the patient’s pre-operative CT scan. After aortic stenting this progressed rapidly to total occlusion with pulmonary collapse and continued dependency upon mechanical ventilation. Although the endoluminal stent excluded the aneurysm effectively, it failed to relieve compression on the bronchus. The insertion of an endobronchial stent resulted in restoration of airway patency but led to pressure necrosis of the opposing walls of the left main bronchus and aneurysm sac which resulted in the formation of a fistula.

We feel from this single case experience that conventional open surgery may be preferable to endovascular repair for the treatment of thoracic aneurysms with associated bronchial compression. If endovascular repair is undertaken because the patient is not considered fit for a thoracotomy
the potential for increased bronchial compression post-operatively must be taken into account. We would suggest that bronchial stenting should be avoided if at all possible under these circumstances but if it is thought to be absolutely necessary a less traumatic stent of appropriate size should be selected in preference to the metallic stents that resulted in an aorto-bronchial fistula in our patient.

References


